Proceedings of the

1936 Annual Conference

of the

National Society for the

Prevention of Blindness

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1936 Annual Conference

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SECTION I

Saving Eyesight in Industry

Presiding: A. L. Rose, Assistant Superintendent, Division of Safety and Hygiene, Industrial Commission of Ohio

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Saving Eyesight in Industry

Presiding: A. L. Rose

Assistant Superintendent, Division of Safety and Hygiene,
Industrial Commission of Ohio, Columbus, Ohio.

Chairman Rose: In bringing this Annual Conference to Ohio, the National Society for the Prevention of Blindness has paid a distinct tribute to the State. The several meetings of the Conference afford an opportunity for exhaustive study of the problems of the prevention of blindness which we have never before enjoyed.

The subject of the saving of the sight of workers is a most important one to industry. It is being recognized that good sight is essential to good production in many operations, and we have had evidences that poor vision contributes to accidents. It is good business to prevent accidents, and it is an important part of accident prevention to protect and conserve the eyesight of our workers.

For the program of this Industrial Section, we have been fortunate in obtaining speakers eminently well qualified to discuss the subjects assigned to them. It promises a liberal education in industrial eye protection and convincing arguments for a more general application of sound, practical methods for the prevention of eye injuries in industry.

Before proceeding with the program, I want to pay my respects to my collaborators in the duties of the chairmanship of this meeting, Miss Margaret Schaefer, Industrial Information Secretary of the National Society for the Prevention of Blindness, who has efficiently attended to the many details of the preparation of this program; and Mr. M. B. Perrin, Chief of the Bureau of Vocational Rehabilitation of the Ohio Department of Education.

I would not undertake or presume to undertake the duties assigned to me on this occasion without the moral support and guidance of my beloved chief, whom it has been my pleasure to serve for more than eleven years, and I just had to have him on the platform with me. He needs no introduction to those of you of Ohio, but to those who have before known of

him by reputation only and have not previously had the pleasure of acquaintance with him, I want to introduce Thomas P. Kearns. For 25 years Mr. Kearns has given himself to the cause of accident prevention and the welfare of those employed in industry in Ohio. I say advisedly that the prominence of Mr. Kearns' services to industry and the results of his devotion to the cause of safety were among the reasons which contributed to the decision to hold this Conference in Ohio. It is quite in order that a meeting of this character should have a greeting from Mr. Kearns.

Mr. Thomas P. Kearns (Division of Safety and Hygiene, Industrial Commission of Ohio, Columbus, Ohio): After listening to that very kind and gracious introduction by my able assistant, Mr. Rose, I feel just a little bit embarrassed. I am afraid I can't measure up to some of the things he has said. As stated by him, I have, of course, spent the best part of my life in safety work. I assure you that I have enjoyed every minute of it because of the great humanitarian aspects of the problem. I think that the great sorrow and suffering that are created by accidents and the attendant costs make it one of the greatest moral, social and economic problems confronting the American public today.

Records show that industry has made some remarkable strides in accident prevention work in recent years, and I think that I can say without appearing presumptuous that the Industrial Commission and the Division which I have the honor to represent as its Superintendent, has had some part, at least, in contributing to the success attending the safety work in Ohio.

Those of us who are in daily contact with the hazards of industry know only too well the definite need for a movement of this kind. Eye injuries in industry are all too numerous, as the statistical records of our Division so emphatically show. In 1935, eye injuries ranked second in the parts of the body affected by industrial mishaps, and while out of the approximately 29,000 injuries that occurred of this nature, there was only one case of total blindness included in the 133 eye losses, every one of these injuries was, of course, a potential chance that some worker would have to pass the remainder of his life in darkness.

It is not my purpose to deal specifically with the records in Ohio in respect to eye injuries, because this subject will be discussed later by Mr. Beall, a member of the Industrial Commission, who has the opportunity to see at first hand the baneful effects of disregarding common eye hazards encountered in industrial pursuits.

Your work is so closely associated with that of the Industrial Commission and our Division that we look upon your organization as an integral part of the great movement for universal safety, and it is a source of gratification to us to be honored with the presence of so many men and women whose only reward for the good they are doing is the satisfaction of unselfish service in a great cause.

We would commend the lofty spirit which motivates an organization such as yours, and the splendid results which it is achieving. I wish at this time publicly to pay tribute to this great organization and to Lewis Carris and his able assistants, who through untiring and devoted service have made possible these splendid records. I know you will be extended the warmest and most cordial hospitality of the city and the state, and we trust that you may have an interesting and a profitable session during your visit here. Judging from the program which you have arranged, both as to speakers and topics, it seems to me that the success of the Conference is assured.

CHAIRMAN ROSE: We also have on the platform Lewis H. Carris who directs the activities of the National Society for Prevention of Blindness and has for three months, to my knowledge, been giving much of his time and working hard for the success of this Conference.

LEWIS H. CARRIS (Managing Director, National Society for the Prevention of Blindness, New York, N. Y.): This is really the official opening of the Conference. Another session is being held in another part of the hotel.

I want to thank you, Mr. Chairman, and you others for the kind words you have said about the Society, and to say that we appreciate the hospitality which has already been extended to us since our arrival.

There is still much to be done by the Society in encouraging more adequate eye safety programs throughout industry. At present, we are, I am happy to say, engaged in revising our manual, *Eye Hazards in Industrial Occupations,* which contains much valuable information for safety engineers, plant managers, industrial physicians and nurses, and others concerned with conserving the vision of industrial employees. I want to thank those of you here, and those in other parts of the country, who are co-operating so actively in the revision of this publication.

Again I want to say, on behalf of the directors and staff of the National Society for Prevention of Blindness, I bid you welcome to this Conference.

CHAIRMAN ROSE: The first speaker on this program is first and foremost a graduate of the "school of human engineering." In his experience, first in newspaper work, then as chief of police in his home city of Lima, Ohio, and for 17 years with the Ohio Steel Foundry Company in charge of the welfare of its employees, Mr. Beall has made the most of the exceptional opportunities for the study of human nature. He has a deep understanding of the mental attitude of workers and the requirements for their well-being. What better qualifications could one have to administer the duties of the position of industrial commissioner, which he now occupies, where he tempers justice with kindness, because of his love for his fellowmen? From his association in foundry operations he knows the hazards of eye injuries in that industry, and from the review of the thousands of claims that come before the Commission he knows the results of them as they are occurring all over the State in all classifications of employment, and can speak with authority on the subject, "Eye Injuries in Ohio Industries."

Eye Injuries in Ohio Industries

J. W. BEALL, Member,
The Industrial Commission of Ohio

According to letters sent to industrialists throughout Ohio by the Division of Safety and Hygiene of the Industrial Commission of Ohio, this session, opening at the Deshler-Wallick Hotel on this date, is only the third conference of its kind to be held by this national organization outside the confines of New York City. In recognition and appreciation of this signal compliment to Ohio many hundreds of letters were sent out under date of November 20, 1936, inviting industrial leaders, safety engineers and others who should be interested in the great work of the Conference, the National Society and the allied organizations, to attend.

The importance of the work sponsored and promoted by this national organization to industry and industrial workers cannot be over-estimated. We sincerely trust the attendance will indicate both appreciation and real interest on the part of employers and safety workers in general throughout the State. Our interests in the great work promoted and sponsored by the National Society for the Prevention of Blindness are mutual. In this work we believe the slogan of the Division of Safety and Hygiene of our Ohio Industrial Commission is most fitting—Safety is Better Than Compensation.

We believe we are fully justified in declaring that if Ohio industry had availed itself of the opportunities for advantages of education provided by this National Society over the years, much suffering and tragedy would have been prevented. We believe that a great number of seemingly trivial eye injuries have developed serious results through lack of eye disease prevention in the days and years preceding the so-called trivial accidents. In caring for the victims of eye injury accidents, we frequently find that latent eye diseases have been lighted up by injury, the ultimate result, in many instances, being partial or total blindness. The efforts of our safety education, sponsored by the Ohio Industrial Commission, through its Division of Safety and Hygiene, are aimed at accident prevention and notable success is being achieved. It is our conviction, however, that eye disease prevention is of equal, if not paramount, importance.

It is unfortunate that statistics have never been and can never be compiled with which to demonstrate the great amount of human suffering that has been prevented both through the efforts of the National Society for the Prevention of Blindness and the accident prevention work of one of that Society's greatest allies, the industrial safety worker. There being no available measure by which to visualize or determine the achievements of prevention effort, our statistician can only resort to a painting of the darker picture of the accidents that do occur and the tragic results left as a residue in their trails.

We have before us tables of statistics showing the history of eye accidents in Ohio industries over a period of 10 years, beginning with 1926 and ending with 1935. These tables will be made a part of the record of this discussion and I will only touch upon them briefly in my oral statement of their contents. We find that in 1926 the total industrial injuries reported to the Ohio Industrial Commission for the purpose of payment of compensation and medical fees aggregated 220,785. Of that number, in 1926, 43,038 or 19.5 per cent were eye injuries. Out of that total, 101 eyes were lost by the victims; four were double eye losses, or total blindness. Omitting, then, the intervening years, we find that in 1935, out of a total of 164,572 injuries reported, 29,536 or 17.8 per cent were eye injuries involving the loss of 133 eyes and including one double loss. In the breakdown of these eye accident statistics, we find that in 1926, 3,300 were due to burns and scalds, 571 due to crushes and bruises, 19,728 due to cuts and lacerations, 489 due to punctures and 18,950 to unclassified causes. The last year of the ten-year period, or 1935, shows a reduction in the total number of eye injuries and better facilities for classification in our Division of Safety and Hygiene. While the eye injuries of 1926

totalled 43,038, the total number reported in 1935 fell to 28,536. We find the number of eye injuries due to cuts and lacerations increased in 1935 over 1926 from 19,728 in the former year to 25,798 in 1935, while in all other classifications, such as punctures, scalds, crushes and bruises, they decreased notably. In 1926 there were 489 punctures while in 1935 there were but 151. The unclassified list in 1926 was 18,950 while in 1935 it was reduced to 393. This great reduction reflects largely, perhaps, the greater facilities in collecting information and making classifications. Of far greater importance, however, is the reduction in total number in the ten-year period, from 43,038 in 1926 to 29,536 in 1935. The percentage of eye injuries, as related to total number of injuries reported during the ten-year period, also shows a reduction from 19.5 per cent in 1926 to 17.9 per cent in 1935. We are of the opinion that the actual reduction in numbers in eye injuries was even greater in number than indicated by the statistician's table because of educational measures and the fact that in 1926 there was a lesser disposition on the part of both employers and employees to report all accidents than in 1935. The depression was a great educator in bringing home to the worker the importance of reporting all industrial injury cases. Industry has learned that the trivial accident of today may have an after result in later years of serious and tragic proportions. The worker has been schooled to understand the importance of reporting all injuries and also of having all injuries attended to by competent physicians and specialists.

The eye injury data for Ohio during the years from 1926 to 1935 inclusive, over which the foregoing items have been collected, is here submitted:

Eye Injury Data for Ohio, Years 1926-1935 Inclusive

Year	Total All Injuries	Total Eye Injuries	Per cent of Eye Injuries to Total	No. of Eyes Lost	Double Eye Loss Cases
1926	220,785	43,038	19.5	101	4
1927	219,997	42,657	19.4	138	5
1928	229,233	44,370	19.4	186	6
1929	261,901	52,311	20.0	245	4
1930	212,750	40,632	19.1	232	10
1931	171,768	29,331	17.1	170	6
1932	131,519	20,040	15.2	129	8
1933	130,316	20,713	15.9	112	1
1934	159,248	27,195	17.1	129	3
1935	164,572	29,536	17.9	133	1

Nature of Injury of Eye Injuries in Ohio During the Ten Years 1926 to 1935 Inclusive

Year	Total All Eye Injuries	Burns and Scalds	Crushes and Bruises	Cuts and Lacerations	Punctures	Unclassified
1926	43,038	3,300	571	19,728	489	18,950
1927	42,657	3,286	640	16,946	227	21,558
1928	44,370	3,651	652	18,046	139	21,882
1929	52,311	4,267	764	22,983	183	24,114
1930	40,632	3,657	676	17,959	148	18,192
1931	29,331	2,785	525	13,453	123	12,442
1932	20,040	2,151	427	9,231	103	8,128
1933	20,713	1,981	440	17,027	99	1,166
1934	27,195	2,586	395	23,457	143	614
1935	29,536	2,780	414	25,798	151	393

In order that we may have definite information with which to direct our efforts specifically toward the prevention of eye injuries, our statistician has provided another table which shows the correct distribution of such injuries among the industries in which these accidents have occurred throughout the ten-year period designated above. This table is interesting in that we find heavy percentages of eye injuries in some industrial pursuits wherein the average layman would think there were few hazards to the eye. For instance, we find that in the paper and printing industry 11.0 per cent of all accidents reported were eye injury cases. We find in the industry classified as textile and clothing manufacture 9.9 per cent of the accidents reported related to eye injuries. Of the injuries reported in public employment 10.5 per cent consisted of eye injuries. We find in machinery manufacture 36.5 per cent of all injuries reported were injuries to the eyes of workers. This table of statistics is herewith submitted in full for your information:

Per Cent of Eye Injuries to Total Number of Injuries by Industry

	Per cent
Total All Industries	17.1
Agricultural	7.3
Building Erection and Demolition	13.4
Construction (Other)	10.0
Chemicals and Allied Products	16.7
Clay, Glass and Stone Products	22.1
Foods and Beverages	6.5
Laundries	8.0

Per Cent of Eye Injuries to Total Number of Injuries by Industry (Cont'd)

	Per cent
Leather and Leather Goods	15.1
Lumber and Wood Products	16.6
Blast Furnaces, Steel Works and Ore Refining	22.5
Assemblying and Erecting Machinery	17.1
Machinery Manufacture	36.5
Metal Goods Manufacture	30.2
Vehicle Manufacture	26.1
Paper and Printing Industry	11.0
Rubber and Composition Goods	12.3
Textile and Clothing Manufacture	9.9
Miscellaneous Manufacture	14.6
Mining	13.4
Quarries and Stone Crushing	17.0
Transportation	10.8
Utilities	12.9
Cartage and Trucking	6.9
Commercial Establishments	9.2
Clerical and Professional Employments	9.1
Care and Custody of Buildings and Grounds	5.5
Public Employment	10.5

Ohio has pioneered in considerable measure in accident prevention work and in this work we have had the support of both employer and worker. I doubt if there is a commonwealth in America where employer and employee have worked so notably shoulder to shoulder in the building of the best compensation and accident prevention law, its improvement and its administration as in this State of Ohio. Others say of us that we have the best and most liberally constituted and administered law on this side of the Atlantic. Employer and employee have labored together for years in the molding of the most satisfactory compensation and accident prevention statutes yet designed. Joint committees representing both employer and employee have drafted many codes of specific requirements for accident prevention for the payment of additional compensation to workers who have been injured through failure of the individual industry in which they were employed to provide the safeguards defined in those codes. For example: if a worker suffers an eye injury in and arising out of his employment and such injury has been caused by failure on the part of an employer to fulfill requirements of a specific safety code, the employer is penalized, through the medium of an additional award to the worker. For the loss of the injured eye or the sight thereof the worker is paid temporary total disability compensation throughout the period of such total

disability. Then, after he becomes able to resume his employment, there is an award of compensation through a period of 125 weeks for the permanent partial disability created by the loss of the eye. Then, in addition to those payments of compensation, the law provides that an additional award may be paid concurrently upon order of the Industrial Commission in an amount from 15 to 50 per cent of all compensation previously, or in future awarded. This additional or penalty award must always be paid direct by the employer and is in addition to his semi-annual premium contributions to the State Compensation Fund.

Our Division of Safety and Hygiene was organized through the enactment of an agreed bill sponsored by both employer and employee. The Division is maintained at a direct cost to the employer, set aside from the compensation fund premiums. The Division does not employ men claiming the right of employment because of political activities but employs specialists, hand-picked for the jobs to which they are assigned. The list of employees includes industrial engineers, construction engineers, safety engineers and a medical man especially equipped for work along lines of occupational disease prevention and inspectors who are specialists in various lines of industry. These men are not clothed with police power, with which, like the Division of Workshops and Factories, to compel the removal of accident hazards. To the contrary, they are accident and occupational disease prevention experts, who co-operate and collaborate with employers and employees, personnel and safety directors, in educational work. They make surveys in all lines of industry and make detailed reports to the employers, making recommendations for improvements in mechanical equipment, educational work for safe practices, design and install mechanical safeguards and conduct far-reaching research aimed at the prevention of occupational diseases and the elimination of accident hazards. Their work is not confined entirely to industrial plants and public and private construction work but reaches out into the social, industrial and educational lines in all communities. Instructive talks, inspirational lectures through use of still pictures and educational entertainment by means of motion pictures are introduced in the schools throughout the State. We realize that the school children of today will be the industrial workers of tomorrow.

We believe that the employers of Ohio, and other states as well, have, in the past, failed to give sufficient attention to the value of good vision in industry but we do know that by reason of the humanitarian work of the National Society for Prevention of Blindness and its allied activities, the employer is beginning to awaken to the situation and that this confer-

ence will contribute to a forward step for the conservation of human eyesight through both disease and accident prevention measures.

CHAIRMAN ROSE: In the files of *Pullman News,* the plant publication of the Pullman Company, there is a picture taken in Lancashire, England, of a two-year-old boy with a big stick in his right hand. That big stick is symbolic of the career of the next speaker, Mr. Harry Guilbert. He fought in the Boer War under Kitchener. He came to America and enlisted in the "Industrial Safety Army," first as safety inspector of the United States Steel Corporation in 1907, then with the American Steel Foundries, the American Car Foundry Company, and Haskell Barker Car Company respectively, and, for the past fourteen years, as Safety Director of the Pullman Company. During this experience he has made the conservation of the eyesight of workers his special hobby, and he is still riding it. With his tenacity of purpose, coupled with diplomacy and years of effort, he has sold the management and men upon the importance of protecting the eyes of workers. Today not only does every man and woman in Pullman repair shops wear goggles at all times while on duty, but no visitor may enter the plant without wearing goggles.

Eye Protection—The Importance of Goggles and Other Safety Equipment

HARRY GUILBERT, Safety Director,
The Pullman Company

It is not a very simple matter to tell a story of such magnitude and importance in a few minutes, but I'll do the best I can and give my offering in a form of potpourri—meaning hash in French.

The previous speaker, who presented a splendid talk, elaborated on the cost of accidents. We are not so much concerned about the cost of accidents as we are about preventing them because in so doing, we do not have to pay for them. Do we? The figures mentioned by Mr. Beall indicate that in ten years, 1575 eyes were destroyed in industry in the State of Ohio, and 48 men lost both eyes, to say nothing of 349,823 so-called trivial eye injuries. Of course, we all know that there is no such thing as a trivial eye injury. Permit me to reiterate. Forty-eight men each lost

both eyes; 1575 each lost an eye; and 349,823 people suffered eye injuries—all in the short space of ten years. It is to be regretted that we haven't the complete record of the other forty-seven states. What an appalling picture it would present.

The sad part of this situation is that every one of these accidental eye injuries is preventable. If anyone doubts that statement, I shall be happy to prove it. As there is no discussion at this point, I shall attempt to outline the salient features of my subject briefly.

The fewer types of goggles the better, because men only become confused when confronted with a large assortment of eye protectors. Then too, limiting the types facilitates the handling of repair parts and reduces the number of them, and further, it is a sound plan for economical and psychological reasons.

Next in importance is the adjustment of goggles. Certainly men are entitled to some service in this direction, and a service of this nature makes the problem a little easier. There is no logic in handing a man a pair of goggles with an "A" bridge when he should be wearing ones with an "E" bridge. A procedure of this kind simply makes the situation more difficult. One must take a little time and patience in seeing that every man is correctly fitted; then a periodic check up should be made for the purpose of adjustment. In other words, you are rendering the employee a service similar to the one you receive at the gasoline station when the attendant cleans your windshield.

For the sake of economy and expediency, buy repair parts in the bulk and do your own repairing.

As to distribution—goggles should be handed to the man when he is employed because then they are a condition of his employment. This again is good psychology because it is much easier to get a man to agree to wear goggles before you actually employ him than it is afterwards.

There is a great deal of controversy in regard to the percentage of industrial workers having normal vision. The figures vary a great deal. If the pre-employment examination indicates that the man has normal vision, we supply him with a pair of stock goggles containing plano lenses—perfectly good pieces of glass free from distortion. If the man has defective vision, like a good many people in this room, we furnish him a pair of prescription goggles containing lenses suitable for his particular type of vision.

A foreman said to me the other day, "Those of my men who are wearing special goggles are performing 25 per cent more and better work." Why? Because these men, for one reason or another, have never changed their

own glasses over the years. Naturally they can see much better with goggles made from a current prescription.

Each man is given a case in which to keep his goggles. This is a good investment from an economical standpoint because it prolongs the life of the goggles.

It is over ten years since a Pullman man lost an eye or suffered partial loss of vision. More than ten years! In five years, 185 men employed by one company have lost an eye. Another company, according to its own records, lost 148 eyes. In our case, as I said before, it is more than ten years since one of our men lost an eye. Ordinarily we never experience much difficulty in persuading a one-eyed man to protect his remaining orb, but if we had talked to the man before he lost his eye in an effort to get him to protect both eyes, in all probability he would not have paid any attention.

We spend approximately $10,000 a year for eye protection—a good investment according to a bulletin issued by the National Society for the Prevention of Blindness which indicates that the total cost of one eye is $12,000. So if we only save one eye a year, our investment is rich in dividends.

We employ approximately 22,000 people, and if you think it is a difficult job to get men to wear goggles, you ought to try some of the women. The girls seem to have an idea that goggles spoil their beauty, and I have had some very trying discussions with women employees in an effort to conserve their vision. You might wonder why a woman in the sewing room should protect her eyes. Every once in a while a needle breaks, and when the broken fragment lodges in an eye, it is likely to prove unfortunate for the recipient. Furthermore, there is no man or woman in America today who can say where, how, or when the next eye accident will occur. When some expert starts to tell you who shall and who shall not wear goggles, don't pay any attention to him because he is not speaking from experience. No man or woman in industry or out of it, for that matter, is immune to painful eye injuries.

Of the 48 states in the Union, 47 have a compensation law. I understand Miss Perkins is trying hard to bring about a uniform compensation law. I hope she will be successful. If so, we won't have as many difficulties in the future as we have had in the past. Why should a man in one state receive $3,300 for the loss of his eye and some other, in another state, receive only $1,800. If there is any logic in this, I fail to see it. Of course, all the money in the world will not compensate a man for the loss of his sight. That is a catastrophe. Did you ever go into an optical

parlor and watch men, women, and children being fitted for glass eyes? Don't, unless you have a strong constitution, because it is rather upsetting to look at those awful empty sockets. The doctor fills them with beautiful eyes, made of glass, perfect matches for the remaining eyes, except that the wearers cannot see through glass eyes.

Men will raise all kinds of objections to goggles. Of course they will. Here are some of them: "I don't want to wear goggles; they look funny." I reply, "You'd not feel so funny with one eye." Another argument: "They hurt my nose. They hurt my ears. They feel tight." I reply, "Did you ever wear a tar-paper kelly, known as a billycock in England. Sometimes in America they call them derbies. Well, tar-paper kellies feel tight around your forehead for awhile, but you don't throw them away, do you? No, because you had to pay for them. You broke them in, didn't you? In other words, you got used to them. Well, the same thing holds true of goggles."

Another specious objection: "The goggles are heavy." Did you ever weigh them?" "No." "Then do so and you will find there is very little difference between the weight of your own glasses and a pair of goggles." The average pair of eye protectors weigh less than two ounces. "Sure, they are a little inconvenient for awhile," I say, "but wouldn't you rather suffer a little inconvenience than suffer the loss of one or both eyes?"

Another objection: "Oh, they give me a headache." "How long have you been wearing them?" I ask. "Oh, just today." "Well," I reply, "suppose you give them a fair trial. Wear them awhile. If they still give you a headache, come back and see us. There must be something wrong but it is not with the goggles; it's with you." When we examine this man's eyes, we may find he is suffering from defective vision and we provide him with a pair of goggles suited to his own prescription.

The favorite objection: "My goggles fog." I have heard this one for twenty years. "They fog; they steam up." Of course, they do, more so with some men than with others. But the solution is simple. Take a piece of ordinary soap, apply it to both sides of the lenses, then polish briskly with a dry cloth, after which the goggles can be worn for an indefinite time without fogging.

Of course, men—and I don't mean workmen only—have all kinds of objections to offer against the wearing of goggles; first, because it is something new and it is human nature to object to new ideas. Yes, to persuade men to protect their sight is a very difficult proposition. That is the principal reason that those who are responsible would rather not tackle it. It is much easier to sit still and permit men to lose their eyes

which, after all is said and done, is a sad reflection on those occupying supervisory positions.

A great many of my contemporaries look askance at our plan. They blame the men for eye accidents. It is so much easier. They say that men will not wear goggles and that the management cannot do anything about it. What do managements do when men break an operating rule? Do they overlook it? After associating with American workmen for a lifetime, it is my opinion that they are the finest and most intelligent group of men in the world. Of course, it was rather difficult for me to sell them on the idea of goggles and, incidentally, in many cases it has been just as hard for me to sell management. It is a question of persuasion, coupled with tenacity of purpose. In my opinion, the reason that more industrial workers are not wearing goggles is simply because the situation has never been presented to them in the proper light.

We have tried for years, in every conceivable manner, to sell our men on the importance of goggles. We tried persuasion, pleading, bulletins, horrible examples, etc., but we didn't get very far until the management promulgated a mandatory rule to the effect that all Pullman employees in the repair shops wear goggles all the time while on duty; and the rule, being universal, includes managers, foremen and visitors. No one is excepted. Why should he be? Nobody is immune to eye accidents and at every gate hangs a notice worded as follows:

> "Officers, supervisors, and employees of the Pullman Company will wear goggles while in the shops."

This notice is signed by Mr. D. A. Crawford, our President. We should be delighted to have you pay us a visit and see for yourself the truth of all the statements I have made. No, discriminating rules and regulations are not the answer to the problem. I know one company that has a rule, number 1716-A. But we have something much more valuable than a safety rule book; we have a safety record which is second to none, not only for our employees but also for our patrons. It is over two years since a fatality occurred in the ranks of either.

I have attended twenty-five national safety conventions and hundreds of local ones and I never fail to hear how careless men are and that every time an accident occurs, the injured man is to blame. This is absolutely untrue. American workmen are not deliberately careless. The first responsibility, of course, is that of the management because management is just as responsible for the safety of its men as it is for production.

Wise management realizes that an organization with a bad accident record indicates that it is inefficiently managed.

The other day I asked a salesman how many safety men he contacted in a year. He replied, "About three hundred." I asked him whether he ever went into the plant with these men and he replied in the affirmative. When I then asked him if any of them were wearing goggles, he replied, "No." Yet, any one of these three hundred safety men would have the audacity to walk up to a workman and ask why he was not wearing goggles. What kind of answer do you think he ought to get?

It is my opinion that eye losses in American industry have a direct reflection upon management. It is not an easy matter to put over a goggle campaign, but as I said before, it can be done. It is up to the management to start the ball rolling. While managements ordinarily will not agree to a mandatory ruling regarding the universal wearing of goggles, they will agree to put goggles on men on certain occupations that are hazardous to the sight. What occupations are not hazardous to sight? Any management will agree that chippers should wear goggles, but if someone suggests that cabinet makers do likewise, objections are promptly in order, in spite of the fact that many eyes are destroyed annually by splinters of wood.

During the past ten years hundreds of goggles have been broken in service, but in not one case have the eyes of the wearers of those goggles been injured. I brought a good example with me. There are forty-four pairs of goggles on that bulletin board over there that were broken while men were wearing them. The display tells a significant story. Underneath each pair of goggles is the man's statement describing how they were broken. I think you will agree with me that some of those eye protectors have saved the eyes of the wearers.

Please don't get the impression from all I have said that the battle is over. I am still fighting to hold the ground I have gained and mostly with people who do not possess open minds. In the past twenty years I have talked to thousands of people but I have never yet met an obstacle that cannot be overcome, all of which depends largely upon how you approach them. In the old days I went around the foundry with a basket full of goggles which were handed out indiscriminately regardless of size or anything else. Is it any wonder that men objected to wearing them? Today it is a different story. Our men and women wear them constantly because the goggle of today is a thousandfold improvement over its predecessor. Many a time a man has come to see me with a pair of shattered goggles in his hand and said he didn't think much of that eye protection

idea when he first started, but he was tickled to death we had sold him on it.

CHAIRMAN ROSE: Thank you, Mr. Guilbert. I could only wish that this hall might have been filled with industrial safety engineers to have heard your address.

Eye hazards are inherent in coal-mining operations, and it is to the credit of the mining industry of Ohio that its percentage of eye injuries to the total number of injuries is appreciably lower than that of the aggregate of all industries of the state. This is due to the measures for eye protection which have been adopted in connection with the intensive safety programs of the larger operators.

The United States Bureau of Mines, through the Experiment Station of Pittsburgh, has been a prominent factor in the reduction of accidents in mines by its demonstrations and advocacy of standard installation in the use of safety equipment.

Aware of the interest of the mine operators in the objectives of this Conference, the management felt itself obligated to devote a part of the program specifically to them, and the assistance of the Bureau of Mines Experiment Station at Pittsburgh was solicited. As an example of its ever-ready helpfulness, we are privileged to have as a speaker the Surgeon of the United States Bureau of Mines assigned to the Health and Safety Branch. He has been with the Bureau of Mines for fifteen years and can speak to you with the authority of that experience on the subject of "Controlling Eye Hazards in the Mineral Industries." I am glad to present Dr. Murray.

Controlling Eye Hazards in the Mineral Industries

ARTHUR L. MURRAY, M.D., Surgeon, Health and Safety Branch, U. S. Bureau of Mines, Pittsburgh, Pa.

The Bureau's opportunity of doing specific work in controlling eye hazards is rather limited. It is such organizations as the National Society for the Prevention of Blindness, the National Safety Council, our good industrial commissions throughout the United States, our very able safety directors, our progressive companies and our very fine industrial medical

organizations that have really done the most in sight conservation in the mineral industries as well as in other industries.

Contrary to the general opinion, the United States Bureau of Mines has no regulatory power. Its relation to the mineral industries is mainly and purely educational, advisory and co-operative. We may make recommendations as a result of investigations or surveys, but when it comes to insisting that those recommendations be carried out, we have positively no authority, being a federal agency and that particular province being within the scope of the individual states and their departments.

To give you some idea of the authority and limitations of the Bureau of Mines, I am going to dwell on the organization and operation of the Bureau of Mines so far as its health and safety activities are concerned.

The original Organic Act establishing the United States Bureau of Mines, approved May 16, 1910, and the Amended Organic Act, approved February 25, 1913, provided that one of the major activities of the Bureau of Mines shall be the study of health and safety in the mineral industries with a view to devising and putting into operation ways and means for conserving the health and lives of those employed. The responsibility for this important duty and function is set forth in section 2 of the Amended Organic Act, which provides:

> "Section 2. That it shall be the province and duty of the Bureau of Mines, subject to the approval of the Secretary of the Interior, to conduct inquiries and scientific and technologic investigations concerning mining, and the preparation, treatment and utilization of mineral substances with a view to improving health conditions and increasing safety, efficiency, economic development, and conserving resources through the prevention of waste in the mining, quarrying, metallurgical and other mineral industries; to investigate explosives and peat; and on behalf of the Government to investigate mineral fuels and unfinished mineral products belonging to, or for use of, the United States, with a view to their efficient mining, preparation, treatment and use; and to disseminate information concerning these subjects in such a manner as will best carry out the purposes of this Act."

The mineral industries cover a large field of industrial activity and, although figures are not available for employment in all its branches, the following data from the Statistical Abstracts of the United States for 1935[1] show employment for 1933, the latest year for which figures are available, and give an idea of the scope of the mineral industries of the United States.

[1]Statistical Abstracts of the United States for 1935. U. S. Department of Commerce. (a) Table 735, page 715. (b) Table 701, page 687. (c) Table 759, page 719. (d) Table 760, page 730.

Branch of mineral industry	Number employed, 1933
Metal mining (a)	57,016
Quarrying (a)	61,927
Metallurgical plants, nonferrous (a)	21,999
Coke ovens (a)	13,598
Coal mining (a)	523,182
Blast furnaces and steel mills (b)	276,847
Manufacture of iron and steel products (c)	554,108
Petroleum refining (d)	69,047
Total	1,577,724

Other mineral industries which are not included in the above and for which no employment figures are available are as follows:

Cement manufacture
Petroleum production
Petroleum distribution
Asphalt production and processing
Ceramic industries

It is probable that if data were at hand for all these branches the total employment for all the mineral industries, especially in normal times, would be found to exceed two millions.

The Bureau's health and safety work is mainly educational in scope and depends upon the co-operation of the operators and their employees for its accomplishment. The health and safety activities are distributed among several branches of the Bureau of Mines, including the electrical section, the gas laboratory, the Explosives Division, the Experimental mine, and the Health and Safety Branch. Most of the work of the divisions other than those in the Health and Safety Branch is concerned with laboratory testing and research. The field and contact work with the mineral industries so far as concerns health and safety is mainly the duty of the Health and Safety Branch of the Bureau.

The field and contact work of the Health and Safety Branch is conducted by a force of approximately fifty employees who operate from thirteen mine safety stations and two mine safety cars strategically located throughout the United States. The work of this branch may be divided into three distinct but closely co-ordinated lines of activity.

Educational

Training in first aid to the injured.
Training in the use and care of oxygen breathing apparatus.
Training in rescue and recovery work.
Training in mine accident prevention.
Dissemination of information on safety, accident prevention, and protection of health through publications of the United States Bureau of Mines:
Bulletins, Technical Papers, Manuals, Miners' Circulars, Reports of Investigations, and Information Circulars.
Contacts by means of first-aid and mine rescue meets, demonstrations, exhibits, safety meetings, and safety conferences.
Many educational data are given verbally as well as through written replies to hundreds of inquiries annually and in connection with service on scores of committees of outside organizations.

Investigative

Mine explosions, mine fires, mine accidents, use and misuse of explosives, electrical equipment, mine ventilation, mine haulage, safety devices, health and safety methods, and numerous other phases of the application of health and safety to the mining and allied industries.

Co-operative

Rescue and recovery work following mine fires and explosions.
Study of problems relating to health and safety.
Industrial hygiene surveys.
Ventilation and dust surveys.
Safe and unsafe practice surveys.
Safety organizations.
Sanitary surveys.

From 75,000 to 100,000 or more persons in the mineral industries are trained yearly under the various courses of instruction provided by the Health and Safety Branch of the Bureau of Mines, and the total contacts made through training, investigations, co-operative health and safety studies, and safety conferences total more than 300,000 per year.

Although in the health and safety work of the Bureau of Mines the entire human body is considered from the standpoint of accident prevention and health conservation, opportunity is never neglected in training work, safety surveys, and contacts to stress the importance of damage or injury to that valuable physical asset, sight.

Through the Bureau's first-aid instruction, by which an average of more than 70,000 employees of the mineral industries has been trained annually for the past several years particular emphasis is laid on the prevention of

eye injuries by stressing the use of protective equipment and the grave necessity for immediate medical attention for all eye injuries. Separate instruction periods of the Bureau's mine accident-prevention course are devoted to discussion of adequate protection against eye injuries and the conservation of sight through sufficient illumination underground; in addition, by safety surveys, attention is centered on possible eye hazards and means of protection against them.

Various publications of the Bureau of Mines direct attention to specific eye hazards, both accidental from injuries and environmental from defective illumination, gases, fumes, and irritating and toxic dusts. These reports suggest the most efficient means of protection against such hazards.

The conservation of vision and protection against injuries to the eyes have received due consideration in safety conferences and safety meetings conducted for the mineral industries.

Statistics have not been gathered covering eye injuries in the various branches of the mining industry; therefore, no definite data can be presented showing the progress being made in controlling eye hazards in the mineral industries as a whole.

That much advance has been made and is being made can be assumed from the experience of various mineral operations given below. These establishments not only have had no lost-time eye injuries during long operating periods but no lost-time injuries of any kind as well.

The following tabulations are taken from data of the National Safety Competition of 1935[2], covering 37 anthracite mines, 109 bituminous coal mines, 24 metal mines, 20 nonmetallic mines, and 146 quarries and open-cut mines, as well as from records considered in making the Joseph A. Holmes Safety Association awards for 1935[3], covering 54 coal mines, 19 metal mines, 3 nonmetallic mines and plants, 6 petroleum plants, and 5 miscellaneous plants.

A lost-time accident in these records is usually one by which the injured person is incapacitated so that he cannot continue his usual occupation at the start of his next regular shift.

Though the establishments cited present many eye hazards, nevertheless, they were able to operate for hundreds of thousands of man-hours without a lost-time eye injury or an injury of any nature causing lost time. Therefore, it is evident that safety is possible not only for the most valued special sense, vision, but also for the entire human body.

[2]The National Safety Competition of 1935, U. S. Bureau of Mines Report of Investigations, R. I. 3308, July 1936.

[3]Minutes of the Annual Meeting of the Joseph A. Holmes Safety Association, March 5, 1936.

Operating period	Man-hours worked with no lost-time accident
Coal Mines	
Dec. 18, 1934, to Aug. 27, 1935	564,649
July 25, 1933, to Jan. 28, 1936	543,258
Aug. 16, 1932, to Dec. 31, 1935	360,657
Dec. 12, 1934, to Jan. 3, 1936	266,639
Dec. 29, 1934, to Jan. 1, 1936	259,013
Metal Mines	
Aug. 1, 1929, to Dec. 31, 1935	658,544
June 1, 1930, to Dec. 31, 1935	602,231
Jan. 1, 1928, to Jan. 1, 1936	297,815
Jan. 1, 1935, to Dec. 31, 1935	253,608
Jan. 1, 1935, to Dec. 31, 1935	196,201
Opencut Mines	
June 1, 1928, to Dec. 31, 1935	782,118
Jan. 1, 1935, to Dec. 31, 1935	717,168
Jan. 1, 1930, to Dec. 31, 1935	418,799
Jan. 1, 1935, to Dec. 31, 1935	253,608
Cement Quarries and Plants	
Sept. 9, 1926, to Dec. 31, 1935	2,769,047
Apr. 17, 1929, to Apr. 21, 1932	2,138,037
Dec. 8, 1926, to July 28, 1933	2,008,208
Petroleum Plants	
July 9, 1935, to Nov. 27, 1935	2,460,000
Sept. 1, 1932, to Nov. 1, 1935	2,201,315
Dec. 5, 1934, to Dec. 5, 1935	1,100,000
Steel Plants and Coke Ovens	
Nov. 24, 1932, to Dec. 31, 1935	1,775,087
Jan. 1, 1931, to Jan. 1, 1936	895,048

The following statement is taken from a Bureau of Mines Information Circular by District Engineer C. A. Herbert[4] reporting the working of an

[4]Herbert, C. A., Working an Underground Mine Six Years without Lost-time Accidents. U. S. Bureau of Mines Information Circular 6677, January 1933, p. 4.

underground limestone mine for six consecutive years without a lost-time accident: "Eye protection is aided by the compulsory wearing of goggles when the nature of the work requires them, because prior to 1925 many accidents were caused by flying chips of stone and steel; each man is charged $1.10 a pair, but the company keeps the goggles in repair free and refunds the money when the employee leaves. The rule requiring men to have goggles with them at all times eliminates any excuse for an eye injury. Apparently it also eliminates eye injuries."

During recent years many of the larger companies of the mineral industries have extended eye protection beyond the bare requirement of the use of goggles. Pre-employment physical examinations have shown that a considerable number of men seeking employment have defective vision. Many of these can be gainfully employed if the defects of vision are corrected. To prevent further injury to the eyesight through undue strain and to decrease accidents and material damage due to poor vision, visual surveys have been undertaken. Where required, glasses have generally been furnished free or at very low cost, and where goggles must be worn, lenses are provided by some companies for corrections of defects of vision.

As a result of 127 eye injuries among its employees from 1925 to 1932, with compensation costs of $27.521.63, the Union Pacific Coal Company in 1933 undertook a vision survey of 1,742 operating officials and employees in its 10 mines. The following conditions were indicated:

436 (25 per cent) had normal vision.
1,306 (75 per cent) had some defect of vision.
593 (28.3 per cent) had major defects of vision requiring correction.

In consequence, the company adopted the following program:

1. Use of protective goggles was made compulsory.
2. Protective goggles were provided with lenses to correct defective vision.
3. The company furnished suitable goggles free to all men then in its employ.

The survey and fitting of suitable protective glasses were completed on April 24, 1933. During the previous eight years eye injuries among employees of this company had averaged 16 per year, with an average compensation cost of $216.70 for each injury. Between January 1, and April 24, 1933, when the vision survey was completed, four eye injuries entailing a compensation cost of $1,960.49 had occurred. With the use of

properly fitted protective glasses work during the rest of the year 1933 proceeded without a single eye injury. A recent letter from Vern O. Murray, safety director for the Union Pacific Coal Company, contains the following interesting information on the results of the campaign.

> "In the year 1934 we had no eye injuries. In 1935 there was one, to a loading end man who had walked up the pan line to the face and claims that he had taken off his goggles to wipe them when a piece of coal burst off the face and struck his eye.
>
> "I have not kept an accurate number of eye injuries prevented by the wearing of goggles at all our districts, but I think that this would be approximately 25. I have picked up a good many pairs of goggles that were broken, and in one case where two workmen were zincing a rope onto a socket the metal exploded covering both their faces and eyes with molten metal. Goggles in this instance probably saved both the men's eyesight as in a good many other cases where flying track bolts and spikes and other flying metal and coal, have saved workmen's eyesight."

A further illustration of what is being accomplished in controlling eye hazards is shown by the following statement taken from a Bureau of Mines Information Circular on Protective Clothing in the Mining Industry, by R. D. Currie and W. J. Fene,[5] which devotes considerable space to the various types, specifications, and uses of safety goggles:

> "A large eastern coal company operating three mines and employing about 1,600 men has made a remarkable reduction in eye and toe accidents during the past 4 years through the use of goggles and safety shoes. Safety hats have been introduced at these mines during the past year. The company did not enforce the use of goggles and safety shoes during 1929, but beginning in January 1930 every man entering the mines and all outside workmen were required to be equipped with safety shoes and goggles. The following tabulation shows the results that have been accomplished by this company in 3 years:

Accident Reduction by Wearing Goggles
Eye Accidents

Year	Accidents	Days lost time	Frequency rate	Severity rate
1929	396	5,839	60.40	0.889
1930	150	3,793	24.42	.617
1931	55	79	14.43	.021
1932	17	13	5.56	.005

[5]Currie, R. D., and Fene, W. J., Protective Clothing in the Mining Industry, U. S. Bureau of Mines Information Circular 6724, June 1933, p. 13.

"All accidents, including those in which no time was lost, are included in the foregoing tabulation. It is noted that the frequency of eye accidents has been reduced 91 per cent and the severity has been reduced 99 per cent."

Among the specifications for lenses of goggles the following are recommended:

1. All lenses shall be made from a single solid glass plate of a quality suitable for optical use and shall be capable of passing the test as to quality, visibility, and shock resistance of the Bureau of Standards of the Federal Government.
2. The strength of all lenses shall be such as to comply with the drop-ball tests as required by the Bureau of Standards in the Federal Government specifications.
3. The optical surfaces of all lenses shall be free from visible surface defects. They shall be ground or polished on both sides. They shall not be effectively out of parallel. All lenses shall be suitable for continuous use by the wearer without discomfort or optical impairment to the normal eye.
4. All lenses in every type of goggle or eyecup shall bear some permanent distinctive marking by which the manufacturer may be readily identified.

From observations and experience the use of wire-screen goggles is not recommended by many operating mining companies. Many users of goggles in the mineral industries who originally started with wire-screen goggles later discarded them for the spectacle or eyecup types.

The introduction and constant improvement of the miner's electric cap lamp during the last decade have contributed very materially to sight conservation. Although the electric cap lamp was primarily designed as a safety measure to prevent explosions and fires caused by the ignition of inflammable mixtures in the atmosphere of gassy mines, the improved illumination of working faces that is provided has been a most welcome means of conserving vision and preventing accidents as well as giving the miner an opportunity to work with greatly increased effectiveness.

Before the electric cap lamp was introduced the working faces of mines had been lighted by means of candles, open-flame oil lamps, flame safety lamps, and open-flame carbide lamps. The carbide lamp provided the best illumination, but because of its variations of intensity, poor distribution over the working area, and tendency to unsteadiness, causing flickering reflections in coal mines and in metal mines where shiny particles are disseminated throughout the ore mined, it was a constant source of eye-strain.

The electric cap lamp, with its increased and uniform illumination, better distribution of available light, and freedom from flicker, has been recognized as a decided aid in conserving the eyesight of those compelled to work underground.

Today most of the coal mines of the United States are equipped with electric cap lamps for underground workers, and many of the larger metal mines have installed them. Severe eye strain is rapidly disappearing, especially among the younger miners at properties where electric cap lamps are in use.

In the mineral industries progress is being made in controlling eye hazards and, as improvements in underground illumination, better protective equipment for the prevention of eye injuries, and more thorough vision surveys become general practices, we can look forward to the time when man's great asset, sight, will be universally conserved.

CHAIRMAN ROSE: This program of "Saving Eyesight in Industry" would not be complete without consideration of eye health as vital to eye-saving. We are especially favored in being able to present as speaker on this subject one who has specialized on it to a high degree, Dr. Paul G. Moore, Department of Ophthalmology, Western Reserve Medical School, Cleveland. From his devotion to the cause, Dr. Moore very generously consented to take the time from his exacting duties for this assignment. Mr. Beall told that most of the industrial accidents are serious and demand the best of attention. During Dr. Moore's practice he has been identified with industry as visiting and consulting ophthalmologist, with the White Motor Company since 1918, and is also consulting ophthalmologist to the Cleveland Railway Company, Corrigan McKinney Steel Company, Fisher Body Company (Cleveland Division) and the Standard Oil Company of Ohio. The Commission considers that these industrial contacts make Dr. Moore peculiarly competent to advise on eye cases in its charge and often refers them for his opinion as an expert in industrial eye injuries; which assures a most interesting address.

Conserving the Eye Health of Industrial Employees

PAUL G. MOORE, M.D.,
Western Reserve Medical School, Cleveland, Ohio

My twenty-four years' experience in eye work have been associated with industry, and during that time it has passed through two eras. The first era was that of conservation of sight after the accident had occurred. In my early years, prevention was not practiced. We tried, we did the best we could, to save what a man had left after the accident. Now, through the efforts of the National Society for Prevention of Blindness, of the Safety Council and of safety men in industry, we are conserving men's vision by preventing accidents.

The discussion of my subject is divided into the following topics: (1) preliminary examinations, inventories and case records; (2) periodic eye examinations; (3) correction of defective vision; (4) prompt first aid; (5) sanitary working conditions; (6) proper lighting; and (7) venereal diseases.

Preliminary Eye Examinations

If one is to conserve anything he should know definitely what he has confided to his care. If we accept property for which we are to be responsible, we wish to know what we accepted and how much.

The average employee thinks he has 100 per cent visual acuity in each eye and would make his employer believe he had. This is an entirely different story from the one told after an accident.

In order to determine accurately an employee's visual acuity so that he may be better placed as to his job, vocational guidance; in order to correct vision and increase safety; in order to safeguard the employee himself by providing proper glasses to prevent eyestrain; in order to increase efficiency; in order to eliminate waste by increasing acuity of vision with glasses, a preliminary examination of the eyes at the time of employment should be made. An inventory of each employee's eyesight is imperative.

In times past it was not done. Some industrial concerns are now making eye examinations preliminary to employment and I believe they will admit that it has paid them.

Too often the employer has assumed that the employee had two useful eyes and that they were 100 per cent efficient. In small shops and in larger ones where large numbers of men are employed at short notice,

little attention has been paid to the acuity of vision or to the question of whether the new employee had two useful eyes at the time of employment.

The point I wish to bring out here is that the Industrial Commission in this state assumes that each employee has 100 per cent vision in each eye and in case of an accident in which an eye is lost the claimant is paid on that basis unless there is a reliable record showing that vision was below normal to start with.

I communicated with the Industrial Commission some years ago, when the question came up, "Should a man be paid 100 per cent loss when we had a definite record to show that to start with all he had was 50 per cent normal vision in the injured eye?" The answer stated that, although the whole eyeball was gone, it was proper for that company to pay for the amount that was lost, which was 50 per cent, because the employee did not have 100 per cent to start with. This company had a reliable statement, as to what the man's vision was previous to the accident, signed by the oculist who examined him.

In a number of cases which have been brought up for trial I believe that the vision has been defective in one or both eyes before the accident, but the claimant insists that he had 100 per cent vision previously, and, if there is no record to the contrary, he received a 100 per cent award.

One may say that in ordinary labor groups and where high acuity of vision is not necessary, the expense of a preliminary examination is prohibitive.

I give the following examples of cases of injury where disabilities were claimed in this class of labor and I believe unjustly so.

A man was crushed in a ditch. He claimed loss of vision in both eyes. When he was examined, there was no evidence of any injury to either eye, but he made the statement to the effect that he had lost his vision. Examination of his eyes showed perfect optic nerves, perfect corneas, and no evidence of any injury to the internal structures of either eye.

The eye examiner is handicapped in making an examination on this sort of individual because if he claims he cannot see with either eye, the examiner is helpless to make any malingering tests on him. The only way he can judge that man's vision is to see how he acts in the room, to see how he acts on the street. The average examiner is not able or does not have the time to make such observations. The Industrial Commission many times has investigated these cases.

The next case is a man with fractured zygoma. On examination, we found he had a high degree of astigmatism in one eye. The curve of the cornea and lens in one meridian was much greater than in that at right

angles to the first meridian, and he did have defective vision. He had had that astigmatism ever since childhood. The accident had had no effect on his eye. His vision was low in that eye from childhood on. He had no claim against the state for the loss of vision in that eye. Of course, if we had had a record of vision previous to the accident, I doubt that any question of injury would have been raised.

Another accident case in this class of labor, in which I insist that it is justifiable and profitable to have preliminary eye examinations, was that of a scrub woman employed by one of the weaving companies in Cleveland. This woman, according to the statement of the shop physician, had a piece of wool in her eye. She had been cleaning around the machines and got the piece of wool in her eye and claimed she had had an accident resulting in the loss of vision. I examined her several days later and she had a severe iridocyclitis. Common sense indicated that she could not have developed that severe inflammatory condition in that eye in the short time that had transpired since the accident, but that woman is putting up a claim before the Industrial Commission and claims total loss of vision in that eye. She should have had an examination and a record of the condition of her eyes previous to employment.

How are these preliminary examinations to be made, particularly in a well-organized shop that is working at full production and where no previous records as to vision have been made, the objection being made that the examination of any group of men would interfere with routine?

Let me set up an ideal to be striven for which, even though impossible to complete, still, if only one or two steps are accomplished, some valuable records will have been secured. Make a complete eye examination or survey of every individual in the plant and a record of the same by ophthalmologists or eye physicians. Dr. William F. Hardy [1] described a survey made of the employees of a certain company in St. Louis to determine their visual acuity and set forth the benefits to be secured from such a survey, as follows:

1. Securing a record of the ocular status of each employee.
2. Assignment of tasks best suited to the ocular conditions of each employee.
3. Increased efficiency and output.
4. Reduction of waste.
5. Loss of customers' business minimized, due to imperfect finished product passing inspection.

[1] Hardy, M.D., William F., and Thursby, A. P.: *A Trial Industrial Survey,* paper presented at the annual conference of the National Society for Prevention of Blindness, November 11, 1929, in St. Louis, Mo.

6. Reduction in lawsuits both from fewer actual injuries and from alleged injuries.
7. Lowered cost of insurance.

This survey was carried out by a number of ophthalmologists or eye physicians in St. Louis and was carried out in three days. Such a survey would be impossible in the majority of cases: (1) because of inability to secure the examining personnel—medical men as advised by Dr. Hardy; and (2) because in most shops it would interfere with production.

What can be done? A great many shops now, through the efforts of the Safety Councils, of the safety personnel, and of this Society, are making preliminary physical examinations. A great many shops have full- or part-time shop physicians who make these examinations. These physicians are accustomed to sending their severe eye injuries to some recognized eye physician.

Let the shop physicians secure proper coaching from the ophthalmologists as to taking visual acuity tests and recording them. Then if the shop physician is proficient, let the ophthalmologist be willing to certify to it so that the record may be recognized by the state.

Remember that Ohio cannot recognize any record as to a man's vision unless, first, it has been made by a recognized and reputable ophthalmologist or a man trained in testing for visual acuity; and second, it cannot recognize the record unless the recorder is willing to sign his name to the record and to be responsible for it.

I want to show you a record made by an optical company, in which there is no signature and no one assumes any responsibility for the reliability of the statement made.

If the shop physician, at the time he makes the preliminary physical examination, only records the vision in each eye, he has done something worthwhile toward protection of the employer against fraud. Accuracy here is imperative, as charts may be memorized. Before the War we had malingerers. We shall have a new class of malingerers when examinations are instituted of another kind.

If the shop physician takes the near vision in addition and records it, the record is more valuable, and if he adds a notation as to the field of vision he has accomplished a great deal. Even if his record is not recognized by the Industrial Commission, still when his report is produced after an examination is made by the state expert, it is going to carry weight for the defense in a suit for undeserved damages.

If the vision of every accident case coming to the plant dispensary were

taken and recorded, before long a large number of valuable records would accumulate.

This brings up the question of examination of employees by opticians, or surveys of plants. This service is given gratuitously by the optical houses, with the expectation that a number of employees would be coerced or frightened into getting glasses through fear of losing their jobs. In Cleveland one or two companies have made such a survey of a number of industrial plants and have given the plants records of their findings.

I have here one of those records, which I obtained from one of the plants. They allowed me this one because the employee was dead. They considered the rest of the records so valuable they couldn't let them out of their hands. To me it is nothing more than a worthless piece of paper. It states the man's name. It states that the vision in his right eye was 90 per cent; in the left eye it was 100 per cent. It doesn't state how they obtained or how they arrived at that percentage. It doesn't state that they measured that man by Snellen's method or any recognized method of ascertaining visual acuity. It just says the vision was 90 per cent in one eye and 100 per cent in the other. It doesn't state whether it was in inches or gallons or bushels. So that is a practically worthless piece of paper. It isn't even signed by the optical company that made it out.

Another example, if I may take the time to put it before you was another company. This incident happened just two weeks ago. The patient came into my office with a history that he had been struck in the eye by a piece of cotton from a buffing wheel and as a consequence he had lost the vision in his left eye. He stated that he had been examined by a certain optical company and that his employers had his record stating that his vision in his left eye was 80 per cent and the vision in the other eye was 100 per cent.

When I first saw him, as he came in from the waiting room, I noticed he had a crossed eye. The left eye stood at an agle of 45 degrees with the other one. He had been able to pass that optical company and obtain a statement that he had 80 per cent vision. The examination was worthless.

In 1924 a visual survey was made of the White Motor Company in Cleveland. Each employee, starting with the superintendents and foremen, was given a physical examination. These examinations were made in groups. Note they started at the top. By starting with the higher-ups, the executives first, the men felt better toward the making of examinations. If they had started at the bottom the general idea would have been that the men who were physically handicapped would probably be discharged.

At the time an examination was made of the eyes, a record was being made of the distant and near vision and the field of vision. I assisted in this survey which was made by the shop surgeon. I had trained a nurse to make the visual acuity tests and the test for fields of vision. Any employee in whom the vision was markedly defective was examined with the ophthalmoscope, particularly if the field of vision was abnormal. The lids were everted for the examination of the conjunctiva and the discovery of any possible trachoma. The cornea was examined for scars. The condition of the conjunctiva and the presence of scars were noted on the record.

Dr. Hardy suggests three minutes as being long enough. The length of time taken for an examination varies with the individual, his mentality, his willingness to be examined, and his ability to read English.

It is my contention that a technician or nurse can be trained to do this kind of work and, if she is directly responsible to an ophthalmologist or a properly trained shop surgeon, her records should be recognized. Many times the mistake is made by industrial concerns, in that they employ a nurse and regard her as a medical man. She should always be responsible to a medical man.

At the present time, in Cleveland, a plan is being formulated and a bureau is being organized to give information to the public or to industrial concerns about the eye. This idea originated when a man was sent to Fisher Body Company to lecture in their instructional courses and the interest of the men in their eyes was aroused. The anatomy and pathology and refraction of the eye were explained in plain, everyday English. The function of this bureau will be the education of employees, following which the examination of and the making of visual surveys of plants and the establishment of reputable records will be easier.

The plan at the present time is being financed by the dispensing opticians. These are the men who fill the prescriptions of ophthalmologists. It is being supervised by a committee of ophthalmologists responsible to the Cleveland Academy of Medicine. By carrying on an educational program first, a visual survey later can be more easily carried out in an industrial plant.

Last year an educational program was carried out in Cleveland and in Lansing, Michigan, by the Fisher Body Company, and they have asked that the work be done again this year. I believe that when industrial concerns realize the value of the surveys they will be willing to help the project financially.

I have spoken at some length about preliminary examinations and the

taking of the inventory of a plant's eyesight because I believe it is most important. A knowledge of the visual acuity of each individual at the beginning of service is of utmost importance.

Periodic Eye Examinations

The preliminary examination is the most important, made, if possible, at the time of employment.

Young workers between the ages of 17 and 25, if myopic, should be examined every three months when doing exacting, close work. They have eyes that are still elastic and the eyeball may be lengthened. On close application, particularly if they do not have proper illumination, their myopia, or nearsightedness, may increase. The nearsighted individual, unless correctly fitted with glasses, is a potential risk in moving machinery.

Another risk for the myope is possible detachment of the retina. To cite one case, a man who was a high myope was a technician and worked in the shop. He wore his glasses and had been working for a number of years. One day a fellow workman threw a piece of wood over his shoulder and struck this man on the forehead. The case was not recognized at that time as an accident, but shortly afterwards, a matter of a week or ten days, that victim complained of dimness of vision. Examination showed that he was developing a detachment of the retina. The retina, or the nerve layer, was separating from the sclera, or wall of the eye, just like the paper on the wall separates from the wall. A few weeks later that man had developed a total detachment in one eye and a partial detachment in the other eye and became totally disabled. That is a risk that a high myope takes in industry.

Employees wearing glasses should be examined or checked at intervals, for alignment of the frames and lenses when they are working on fine, detailed work.

Men with refractive errors requiring glasses should be protected with goggles, in grinding, or the efficiency of their lenses may be destroyed.

Men over forty years should be watched closely, for presbyopic changes come quite rapidly in the forties, and a sixty-fourth of an inch becomes difficult to see. Presbyopia begins, on the average, at about forty-five years of age. In farsighted people it begins earlier. In order to see fine details, correction is imperative.

After the first examination, should further examinations be made? Yes. In industries employing solvents injurious to eyes—wood alcohol, carbon-bisulphide, etc.—examinations should be made at frequent intervals to de-

tect the development of retrobulbar neuritis or toxic amblyopia, scotoma, or spots in the visual field, and unsustained contraction of the pupil.

To recapitulate, the initial examination is the most important. Then a record of all eye accidents should be added to this preliminary record.

The visual survey at White Motor Company was made to: establish a record of visual acuity; remedy visual defects and so increase efficiency; record part disabilities; and prevent accidents and further loss of sight or limb or life.

A second examination might be made at a certain specified time, as indicated below:

1. Every three months—men in industrial work hazardous to eyes.
2. Every six months—young employees with high myopia, if between the ages of 18 and 25.
3. Every year—men over 45 years, especially if rapid diminution of vision is developing. Development of cataracts may thus be discovered.
4. Every two years—such employees as testers, motormen and bus drivers, who come in contact with the public and must safeguard themselves, other employees and the public.

The preliminary examination establishes the case record. When any accident occurs later, this case record should be brought up to date.

Senile cataracts develop between the ages of sixty and eighty, but quite frequently we see senile cataracts developing in early age, say at forty, and if we are not on the lookout those cases may be developing among our employees.

At each of these examinations a note of any changes in vision or new development should be made. In taking the history of accidents, every possible detail leading up to the accident should be noted, to avoid unpleasant complications. No suggestions which might be developed into misleading histories should be given. Histories taken at the time of the accident are probably more truthful than when time has elapsed, offering opportunity to bring in other details.

The correction of defective vision is a means of preventing accidents. If every one had 100 per cent vision, accidents would occur less frequently, work would be more accurate and waste would be lessened.

The average employee has the idea that his vision is 100 per cent. This was proved during the examination of men for the draft in 1918. Every man who did not want to get out of the draft thought his vision was 100 per cent until shown otherwise. This has been demonstrated in the industrial eye surveys which have already been done.

If employees know they have poor vision, why do they not get glasses? (I am not referring here to goggles.) I enumerate several reasons:

1. A great many men who apply for jobs have no money with which to buy glasses. If they do have the money, they may not wish to spend it.

2. A man who has to wear glasses feels that if he wears glasses he may be giving away his age to his employer; and the employer may feel that he is too old to hold down the job.

3. A great many men object to glasses just as the ladies do, through vanity.

4. The inconvenience and handicap of having glasses on the face—the strain.

Another item I want to bring up here in the preventing of accidents is the habit of placing pensioners in certain jobs. I feel it is a mistake to put a pensioner, a man who has defective eyesight, on an elevator as an elevator man. I have seen it in several plants. They think it makes an easy job for that injured individual, but I believe an elevator man should have just as good vision as a bus driver or an automobile driver.

Another pensioner job in factories is the man who pushes around a small cart. Many times he is a man who has defective vision. That man also should have good vision because he is endangering his fellow workmen.

To recapitulate, the correcting of vision is to prevent fatigue, increase production, eliminate waste, increase accuracy. I appreciate the work you safety men are doing daily in educating your employees, for I have the same thing in placing glasses on physicians. A great many physicians come in for examination and say, "You are not going to put any bifocals on me. I don't need them!" It is surprising that a medical man would think that. But after his eyes are examined and after he has been properly fitted with glasses, he sees what he has been missing, and there is no trouble in convincing him that he needs them.

One of my patients is a dentist who came into the office one time because of an iritis. He said to me, "You know, there are a lot of these dentists who talk about hair lines in the teeth. I want to tell you that that is all the bunk. There aren't any hair lines in teeth." A short time after that, he came back to me for refractive correction. I fitted him with glasses, and he said a few weeks later," You know, I was all wrong about hair lines. There are hair lines in teeth."

We don't appreciate the fact that presbyopia grows on us so gradually, so insidiously, that we actually don't realize how much visual acuity we have lost.

First Aid

In talking about first aid, I shall just mention a few aspects.

We ought to render prompt first aid in order to increase the morale of the man. The employee is much more interested in his job and in his company when he realizes his company is supplying him with proper first aid. If he is supplied with a nurse or shop doctor who is gentle in manner, he is favorably impressed; and vice versa he can be driven away by improper methods or by roughness in technique.

Accidents should have prompt treatment; prompt removal of the foreign bodies will prevent tampering later. A man should be taken care of within the half hour after his accident occurs. He should be able to secure this relief without having to wait. Don't let him go out and get aid from the outside.

I have been considered rather a heretic in my own town because of my feeling that we can have trained nurses to take care of some of this accident work, but I insist that there must be someone to whom the nurse is responsible. She must also recognize her own limitations.

Proper Sanitation and Lighting

As far as sanitary working conditions are concerned, they are simple matters. We have all been instructed on the use of individual towels to prevent carrying infection from one to the other. In some localities trachoma is still a very active problem. It was a problem in Cleveland, but fortunately it has been reduced so remarkably that it no longer constitutes a problem.

Another subject to be discussed in conserving the health of patients is proper lighting. In that regard, I only want to read you a couple of paragraphs that were broadcast by the Sight-Saving Council last week in Cleveland.

> "The Ophthalmological Club of Cleveland has made several recommendations for the correct use of lighting.
>
> "The first recommendation is with reference to glare, and it cautions people to avoid glare from the work-area or from the field of vision. By glare is meant the discomfort and handicap to vision that comes when bright areas exist within the field of vision.
>
> "When one is in the bright sunlight out-of-doors and suddenly enters a darkened house, there is a perceptible shock to the eyes, and even a greater shock when one leaves a darkened place and goes into the strong sunlight. These infrequent shocks are not as harmful as glare coming from exposed light bulbs and often from reading print on glossy paper that reflects light.

"The second recommendation is to secure proper diffusion of light throughout the field of vision surrounding the work-area. This is accomplished when there is sufficient light, so evenly diffused as to ensure eye comfort.

"The third recommendation is to have ample illumination to avoid eye-discomfort and eye-fatigue, and enough to safeguard against nervous or physical strain."

Summary

To recapitulate on our subject of conservation of eye health, let me insist that first we should have a preliminary examination or inventory of the vision that we have to start with; second we should have periodic eye examinations; third, we should correct defective vision in order to increase man's ability and also to protect him; fourth, we should have prompt first aid; and fifth, we should have sanitary working conditions and proper lighting.

SECTION II

Eye Health in Relation to Social Work

Presiding: Isabel Walter, Executive Secretary, Family Bureau of Franklin County, Columbus, Ohio

Eye Health in Relation to Social Work

Presiding: ISABEL WALTER,
Executive Secretary, Family Bureau of Franklin County,
Columbus, Ohio.

CHAIRMAN WALTER: I promised that I was not going to make a speech. I do want to say, however, that I think that those of us who live in Columbus and in Ohio are very fortunate to have a meeting of the National Society for the Prevention of Blindness here in our state, and I hope that we will get a great deal out of these meetings. I think we need to, and I think this is a real opportunity for us. We are very happy to have the meetings here.

The first paper on our program this afternoon is to be presented by Dr. C. E. Rice, who is consultant for the Social Security Board at Washington.

Some Problems in Eye Care Concerned with Prevention of Visual Handicaps

C. E. RICE, M.D., Consultant, Social Security Board,
Washington, D.C.

Many of the pathological conditions in the eye which may result in reducing vision cannot be very successfully checked after they have once started their work. Others can usually be prevented from permanently destroying sight if appropriate measures are taken.

Taking up these different conditions and variations from the normal in the order in which they usually affect life's span, we shall first consider the infections of the eyes of the newborn.

Eyes of the Newborn

First, I should like to make the point that ophthalmia neonatorum, or in plain terms "inflammation of the eyes of the newborn," does not always mean the presence of a venereal disease in the birth canal of the mother.

There are several germs other than the gonococci which can infect the infant's eyes at birth. However, the most violent and dangerous infections are usually caused by the organism which is responsible for gonorrhea.

The instillation of silver nitrate in the eyes of the newborn infant within a few minutes after birth has now become a world-wide procedure. The instillation can be properly or improperly done. It is best to do it twice, the second time about one hour after the first drops were given. The solution used can be inert or its chemical nature may have changed because of age. The idea is not to cure, but simply to keep the number of G.C. organisms in the birth canal down to a minimum until after the infant is born. Many state health departments have very properly assumed the responsibility of distributing free to physicians and midwives, a solution of silver which is efficacious and which will keep many months without chemical change.

Recently, a physician of Philadelphia read a paper in which he advocated the treatment of prospective mothers for gonorrheal infection, if they were suffering from it, as another aid in preventing infection in the eyes of the infant. This is not always done. I presume the idea uppermost in the mind of the physician which leads him to refrain from such treatment has been the fear of producing an abortion. The physician who advocated such prenatal treatment shows that such fear is without foundation.

But what of the infant or youth or adult who acquires, in spite of all preventive measures, a gonorrheal infection of the eyes? Immediate hospitalization is always indicated. Every hour of delay means danger of blindness. Many local health departments have the responsibility of providing medical care for such an infant if the parents are not financially able to provide it. Probably the plan of the New York State Commission for the Blind for handling these cases is the most practical. That Commission maintains a revolving fund from which it is able to authorize immediate hospitalization for any case of ophthalmia neonatorum arising in the State. That plan is worthy of copy not only for infants but for youths and adults who acquire this disease and are in need.

Myopia

The next condition for consideration which should probably have been considered first is myopia; possibly one should say progressive myopia. It is worthy of first consideration on the grounds that it must be a developmental defect of the coats of the eyeball. It may go even farther back

and have its origin in the make-up of the germ-cell. The cause or causes of progressive myopia, or even the non-progressive type, are not known. Neither do we definitely know what factors influence the increase of the myopia while the child is growing.

Although we do not know definitely whether myopia is a developmental defect due to influences acting while the fetus is growing in the uterus, it would seem to be the wise thing to encourage the partaking of a wholesome diet fortified with the vitamins of cod liver oil throughout pregnancy, especially in the case of a mother who already has one child that shows a marked myopia. It seems certain that the problem of preventing myopia must deal with influences at work before the birth of the child.

Cross-Eyes

In the case of squint, or crossed eyes, it is still a common thing to hear people and even medical people say that the condition is unimportant and that the youngster will outgrow it. It is very true that during the first few months of life, the eyes very commonly do not work together; they become crossed or out of line, but when this condition persists or is noticed at intervals in the year-old infant, then something should be done about it. To neglect the condition may result in blindness of the eye which turns. Such blindness apparently results from disuse. In other words, the squinting eye is not being used as a visual organ. The immediate problem may be to compel the child to use the turning eye by covering up the other one. Then glasses may be placed on a very small baby, if indicated, with the hope that proper correction of a marked refractive error will correct the squint. This partial blindness of one eye—amblyopia of disuse, as it is often called—which results from a squint in early life, is unfortunate since so often it can be prevented.

Often crossing of the eyes is due to purely mechanical reasons which can only be corrected by operation. Sometimes it seems to be caused by lack of ability to fuse the pictures in the two eyes. This lack of fusion ability is a complicated subject. In some cases, the ability to fuse can be developed to a great extent by proper training. This is where the orthoptic clinics come in. If the mother is intelligent and patient, she can probably be taught to train the child in this. Many cases can never be taught to develop binocular single vision even though the eyes are apparently working together. Binocular single vision is going to mean more to the youth of the oncoming generations because of the growing importance of air travel. Without well-developed binocular single vision one

does not have a normal depth perception; and without a normal depth perception, the future aviator and aviatrix will not be able to navigate safely in the air.

Why do some children lack this fusion ability which is apparently the frequent cause of squint? It is possible that some of the early infectious diseases are the primary responsible factors through effects on the fusion center in the brain. Even if this responsibility can never be definitely determined, we can at least encourage early immunization to those infections and encourage efforts against untimely exposure of the infant to the communicable diseases.

Syphilis and Eye Health

We now come to a problem about which we do not have to speculate, namely, the results of prenatal syphilitic infections on the eyes of youths and young adults. This is a tragedy that can be easily prevented by treating the expectant mother for her syphilitic infection, during pregnancy. A blood test for syphilis should be a part of the services rendered in every case of prenatal care. In other words, such a blood test of the mother should be a part of the eye care of the coming infant.

Interstitial keratitis

The disease of the eyes in youths and young adults which results from the presence of syphilitic infection in the mother during pregnancy is called interstitial keratitis, meaning a deep inflammation of the cornea. It is difficult to handle and usually persists for a long time. It often results in great damage to vision and even blindness.

Not all cases of interstitial keratitis are due to syphilis. A fair percentage result from tuberculous infection elsewhere in the body. Expert examination is needed to differentiate between those caused by syphilis and those resulting from tuberculosis. While tuberculosis may attack the anterior portion of the eye or cornea, producing a form of interstitial keratitis, it is more likely to attack the inside of the eyeball and produce great damage to vision. So guarding the infant and youth from exposure to tuberculous infection, either the human or bovine type, may prevent future blindness.

Optic Atrophy

Optic atrophy is a common cause of defective vision and blindness in the middle and later span of life. The causes of atrophy of the optic nerve are legion but the greatest number are the result of acquired syphilis. This condition usually creeps up on one without pain or discomfort and

the only sign of something wrong will be a gradual diminution of vision. This is where expert teamwork is so necessary, as the co-operation of many well-trained specialists may be necessary before the cause is discovered. It is most important, however, to discover the optic atrophy early enough to save some vision. Probably one cannot reiterate often enough that the conscientious, thorough routine examination by a physician skilled in diseases of the eye is the way to discover early optic atrophies, and usually this may be done when the patient comes for a change of glasses to aid his failing vision.

Glaucoma

These statements can apply equally well to what is known as chronic simple glaucoma. In this condition there are varying degrees of increase in pressure within the eyeball just as a steam boiler has pressure within it. This increase in pressure within the eye may come suddenly and with great pain. The patient seeks immediate relief. But where the increase in pressure is not so great and occurs over a longer period of time, there is usually no pain; the only sign may be a gradual loss of sight or quite often not even any loss of sight but a slow loss of peripheral vision until he has what is variously known as "rifle vision," "tubular vision," etc. When this stage is reached, the patient sees only straight ahead and objects that are on one side or the other are not seen unless the eyes or head are turned. Vision straight ahead may be wonderfully well preserved up until the very end, when sight is finally lost.

Glaucoma probably causes more blindness in the latter span of life than any other disease. The biggest problem is to persuade the patient that blindness will overtake him if there is not continuous supervision over a long period of time, possibly the rest of his life. For this, it is necessary to win completely the confidence of the patient. Of course this ideal rapport between patient and staff or patient and physician can occur only if there is someone present who has the time and inclination really to get acquainted with the glaucoma sufferer; also it is important that the same medical adviser continue to serve the patient during his frequent visits to the clinic.

Medical Social Service

It should be obvious that I am alluding to the services of a medical social worker in the eye clinic, or possibly the necessity of such a specialist in the successful handling of certain kinds of eye diseases such as glaucoma, optic atrophy, luetic infections, and motor disturbances in the young.

A person with any of these conditions who comes to an eye physician as a private case misses this specialist in human relationships, this interpreter of medical science. Does the private patient have such intelligence that social service would not be appreciated, or does the physician successfully do this work in his private practise? It would be interesting to study the ultimate result of 500 glaucoma cases in the private practise of physicians as compared with 500 cases from clinics with reasonably good social service organizations. However, I am not thinking of the private practise of ophthalmology alone. Most people would probably say that the cost of private medical care is already so great that additional frills are unnecessary.

Nevertheless I should like some time to hear this question discussed: "If the services of a medical social worker, as applied to the clinical practise of ophthalmology, fill a fundamental need in the prevention of blindness, why may they not have application in some modified form in the field of the private practise of ophthalmology, for the purpose of preventing visual handicaps?"

CHAIRMAN WALTER: The next paper on our program is "A Case Work Approach to the Problems of Impaired Vision."* Miss Marjorie Boggs, who is Case Consultant for the Associated Charities, Institute of Family Service in Cleveland, is going to discuss that subject for us.

Discussion

CHAIRMAN WALTER: We are very much indebted to both Dr. Rice and Miss Boggs for these splendid papers.

We are fortunate to have available this afternoon the assistance of two other outstanding caseworkers who are prepared to discuss these papers. Following their discussions we are going to throw the meeting open, because undoubtedly you will have questions that you will want to bring up, or perhaps some contribution that you want to make to the discussion.

We are very fortunate in being able to persuade Miss Theresa Neuburger, who is Chief Eye Social Worker at the Washington University Hospitals and Allied Clinics of St. Louis, to discuss Dr. Rice's paper.

MISS THERESA NEUBURGER (Washington University Clinics and Allied Hospitals, St. Louis, Mo.).—As a medical social worker, I should like to

*"A Case Work Approach to the Problems of Impaired Vision" by Marjorie Boggs, Case Consultant, Associated Charities, Institute of Family Service, Cleveland, Ohio. Published in the *Outlook for the Blind*, June, 1937. Reprints available upon request.

express appreciation of the emphasis on prevention of Dr. Rice's paper. He speaks of such a worker as a "specialist" in "human relationships" and to that point I should like to say a few words. The worker's approach to prevention, as well as to those already ill, has a different content and emphasis than that of some others who are active in the field of health work, since she concentrates on the individual in contrast to emphasizing mass education. It is an accident that social work is an outgrowth of dependency, but more and more it is being recognized that among the wealthy, just as among those who are less fortunate, health problems are complicated by attitudes, misunderstandings, fears, and impediments of social relationships, and that everyone needs the contribution the social worker makes to the medical team. That need and the contribution the medical social worker makes in the treatment of the patient have been well demonstrated.

Dr. Rice has discussed a number of eye conditions, serious in their implications, both as to vision and the normal way of life, the majority happening to be those the social workers are most concerned with at Washington University Clinics. I should like to mention one or two cases, briefly, to illustrate individualization and the fact that no matter how early the doctor gets the patient who has glaucoma, optic atrophy or whatever, treatment will not go on unless other factors—social, mental and spiritual—are given study and due consideration; and unless the patient, as an individual, is helped to get them into healthy focus.

Mrs. S., a handsome middle aged woman, vision so low that she had to be led about, failed to return to clinic. She had glaucoma and cataract, and the cataract could not be extracted until the glaucoma was well under control. A home visit revealed no financial stress, but the fact that she had not an understanding of her eye condition and of what might be hoped for from treatment, and she had taken to her bed, accepting it as the will of God that she was to be permanently blind.

As a result of individualization and discovering what the difficulty was, treatment was resumed and continued—and today, after cataract extraction, Mrs. S. has sufficient vision for functioning normally.

Stella is a nine-year-old girl who was found to have optic atrophy, myopia, and reduced vision, when she came to the eye clinic. Complicating social problems immediately presented themselves. Her parents could not understand why exhaustive general physical examination was necessary, since the trouble was in the eyes, nor could they understand why reports of their own blood tests were desired. Further sight-saving class placement was advised, and resisted by the parents, as it would mean a move into a different neighborhood where

rents were much higher. After understanding relationship had been established with the parents, they became full participaters in the treatment plan, such confidence being secured more quickly, perhaps, because a careful study of Stella's school placement had been made at once and found to be almost an ideal one, and based upon it the doctor had withdrawn his recommendation that she be transferred. A program of careful watching followed and when marked progression in myopia developed there was no protest on the part of the parents when sight conservation class placement was again advised.

At last year's Conference, Miss Smith, of the Massachusetts Eye and Ear, gave a thrilling report of vision conserved for hundreds of glaucoma patients. In contrast, a study was made of glaucoma patients at Washington University Clinics before a medical social worker was added to the team. Of the total number, 50 per cent of the patients were seen only once—not one return after the initial visit; and only 5 per cent returned for as long as a year.

Like Dr. Rice, I should like to hear discussed the question with which he ended his paper. Ophthalmologists would doubtless vary in their opinions. One on our staff has said to me many times that he would be happier about his private glaucoma patients and others, if they had such service as the medical social worker gives the clinic patient.

CHAIRMAN WALTER: Miss Elsie Jones, of the School of Social Administration, Ohio State University, has agreed to discuss Miss Boggs' paper for us.

MISS ELSIE VOORHEES JONES (School of Social Administration, Ohio State University, Columbus, Ohio).—Miss Boggs clearly sets forth the major goal of social casework—to help an individual to live in harmonious relation with himself and with the world about him. She also sets forth the philosophy of the caseworker: respect for personality; ways and means to release binding pressures, within and without, which inhibit harmonious and successful living; the recognition that the client makes his own adjustment; consciousness of her own reactions to the client and control of these reactions; knowledge that the casework approach is made to an individual who happens to have any number of problems as in these cases it was impaired vision—one of many other problems.

In telling the two stories of adjustment, Miss Boggs demonstrates the important methods of social casework that tend to bring balance between the self and the social environment. We see the effort to find behavior patterns of John and Bob and in both instances it was psychological

escape. John was urged in the direction of intellectual compensation by his mother's praise, rather than by his own actual accomplishment. In Bob's case, withdrawal and complete inactivity were his methods of escape.

In order to discover these patterns of behavior, the caseworker was a creative listener and questioner, always starting just where John and Bob were. Not only in interviews, but by contacts with their social environment, she helped them to think through their problems. Further evidences of her help are indicated herewith:

1. In a survey of scholastic achievements in John's case and a study of Bob's record in special classes for sight saving and the teacher's efforts in his behalf.
2. In acquaintance with John's father and mother she learned of their inhibiting attitudes and, in Bob's case, of his sister's inhibitive attitude.
3. In having deferred all judgment until she really knew John and Bob she was able to find in them constructive attitudes and abilities on which to build plans. In John's attitude toward his unattainable goal she saw not only fantasy but genuine effort in competition with the sighted in school and activity, and unusual reasoning ability and sound judgment in concrete situations. She saw the possibilities in Bob's favorable attitude toward farm life and in the quickening of this attitude, developed by a visit to the farm and feeding the chickens.
4. In having worked with the families to try to modify their attitudes, without any implication of criticism.
5. During these interviews with John, he made the stimulating discovery that he could do his own thinking and make his own decisions.
6. Through these many contacts the clients plan has been revealed and now comes the choice of work opportunities which is one of the tests of the worker's real skill. She was able to find employers free from emotional attitudes toward handicaps, and with understanding of emotional immaturity. Finally the social caseworker continues her contacts with Bob to be ready to stand by in any new crises.

Miss Boggs suggests that the social caseworker's approach is not different from the approach in education or medical prevention, since she must think in terms of the particular problems as they relate to the individual's inner and outer harmony. If we categorize people as blind, tuberculous, etc., we do not then see the real person. She mentions that we hear of the psychology of the blind and points out that some tendency may be peculiarly theirs—such as introspection, fatigue, and discouragement, resulting from competition with the sighted, a greater degree of negative self feeling—but she points out that we should ask ourselves if many of

the characteristics commonly associated with the blind are not born of common misconceptions and apprehensions of the sighted. The caseworker needs to know the psychology of the individual rather than the psychology of the blind.

CHAIRMAN WALTER: I am wondering if either Miss Boggs or Dr. Rice have anything that they would like to add, or if they would like to answer any of the questions that have been raised by the discussants, before we proceed to a general discussion. If not, the meeting is open for discussion. This is your meeting. I feel personally that it has been very worth while, and I hope that you will add to the value of it by raising questions that have come to your minds as you have listened to the papers, or adding to the discussion.

There are one or two things that I should like to have discussed further. One, of course, is the question with which Dr. Rice and Miss Neuburger really ended, and that is the effect of medical social work in the treatment of certain eye diseases. How much actual evidence have we of the helpful effect of a continuing program of medical social work in connection with clinics compared with a situation where there has been no medical social work? Another question that came to my mind is the question of the caseworker's approach to the problems of prevention of blindness, in her contacts with clients. Is it any different from our approach to working with the sightless, from our approach to working with any handicapped person?

Another question has occurred to me more and more as I have been sitting here, perhaps in connection with my own reactions. When Mrs. Merrill first asked me to help with the program, I had a great feeling of hesitancy, of not knowing anything about this subject at all, and I think that is rather typical of a great many caseworkers—the feeling that we don't know anything about this subject, and yet, as I heard Miss Boggs' paper, I thought, "Well, after all, if we are not particularly fitted for certain types of social work, we certainly should not rush in where angels fear to tread. Yet aren't our fears, to a great extent, rather groundless? Haven't we adopted some of the attitudes of the general public, and what influence does that have in our approach to these problems?

MRS. ELEANOR BROWN MERRILL (National Society for Prevention of Blindness): May I say a word in further answer to that first question you raised, Miss Walter, and the one with which Dr. Rice and Miss Neuburger both ended their papers. Miss Neuburger has made reference to the work done at the Massachusetts' Eye and Ear Infirmary, through the

Glaucoma Clinic, and I think she has shown very strongly the contrast between an intensive casework handling of glaucoma patients there as against the Washington University clinics before they had a caseworker, when only 50 per cent of the glaucoma patients were returning after an initial visit.

Last fall in her report, Miss Smith brought out the fact that in the six or seven years during which the Massachusetts Eye and Ear Infirmary has had a medical social worker assigned to glaucoma patients the number of glaucoma patients carried in the Massachusetts' Eye and Ear Clinic has grown from 200 or 300 to between 1000 and 1100. It is very difficult to know just what has been accomplished in the improvement of vision or in checking the progress of those glaucoma cases; it is something very intangible, but there is very definite proof that the larger number of patients are now coming to the clinics regularly and are having, in many instances, the progress of their glaucoma condition checked because of that continuous treatment.

In this connection I might mention a plan that is being considered by another community, for following glaucoma patients in the city, not through one central clinic, as in the Massachusetts' Eye and Ear Infirmary, but through a co-ordination and working of all the hospital outpatient departments in the community, with the assistance of the ophthalmologists and medical social workers assigned to glaucoma patients. It is felt in that community that perhaps the thing is not to bring glaucoma patients to one center, or to encourage their coming to one center, but to have them go to various clinics where glaucoma patients are being treated. They would all be handled by doctors interested in glaucoma, and followed up by social workers attached to those services. Through co-ordination from some central group in the city, uniform recording, classification, and reporting of the cases could be followed so that there might be amassed general information as to what is being accomplished by a careful following of patients in various walks of life and in various parts of the city. In keeping with casework policies, there would be a clearing of patients handled in various centers to avoid the chances of the patients' shopping around, and duplication of treatment. This plan is something that is now being considered, but on which we hope in another year or two there might be some report; our further hope is that in some years to come, through intensive handling of glaucoma patients in these several places, there will be an accumulation of information and records that will have real value from the standpoint of the medical treatment of the glaucoma patient.

CHAIRMAN WALTER: I agree with Miss Neuburger and Mrs. Merrill that those are certainly thrilling accomplishments, at least in the case of the Massachusetts' clinic, and this new experiment sounds most interesting. I, for one, would be very glad to know how it works out eventually.

MR. WILLIAM E. BARTRAM (Chief, Bureau of Aid to Blind, Ohio Division of Public Assistance, Columbus, Ohio): You asked a question a few moments ago that caused me to reflect on ancient history in this state. Sometimes procedures in their nearness cannot be weighed properly; we cannot always draw morals from our preachments immediately. Twenty years ago—if I am not bringing up an old and trite subject too often—ophthalmia neonatorum was one of the very serious contributing factors to our problems of blindness in the United States. I can't say that it isn't a problem today, but I believe that I am correct in saying that in twenty years it has been reduced by more than 75 per cent, at least as a cause of blindness among those in schools for the blind. In the past five years, we have had only three authentic cases of ophthalmia neonatorum reported to us in the State of Ohio. There have been other cases that have been doubtful in nature.

The question naturally comes up as to what is the relationship between the vast improvement in this work and the interest of social workers in the field of prevention. The social worker today is the modern propagandist for better living conditions and community health, and she can arouse a public opinion to combat other types of unnecessary blindness just as social agencies twenty years ago were successful in arousing public opinion against ophthalmia neonatorum.

Today, the control of venereal diseases engages the attention of public health officials in Ohio as in other states. I think in the past year or so we have begun to have a little better understanding of the relationship between venereal disease control and prevention of blindness.

You social workers and you medical social workers have a very serious and weighty responsibility in the prevention of blindness. You not only have a better opportunity, in your contacts in the homes of the underprivileged, to serve them and to analyze and weigh social situations, but you have an even better opportunity to place before the leaders of thought in your community the benefits of your experience and observation. It is my personal conviction that the social worker should be a first-class propagandist and consider it a major duty in the prevention of blindness to disseminate information to the proper places and to stimulate community activity toward eradication of causes of preventable blindness.

CHAIRMAN WALTER: I think Mr. Bartram is absolutely right and that we do have a very definite obligation to go out and roll up our sleeves and do what we can to institute educational campaigns and to help people to know the truth about causes not only of blindness, but of various other social ills.

The things that he said made me wonder a little more—and maybe this is getting a bit off the subject—about the program of the Social Security Board and various state agencies that are working in co-operation with the Social Security Board on programs of aid to the blind—what plans, if any, are being made to arouse the workers in various agencies to the need for that sort of a program and what means are being taken to instruct them.

MR. BARTRAM: I shall speak of the State of Ohio. We are in our infancy so far as the social security program is concerned. Our state agency has been interested in the problems of blindness and the prevention of blindness since 1912, when the first definite survey and recommendations were made regarding the extent of ophthalmia neonatorum.

There is one thing I hope above everything else, that as this program grows, people will realize that there is an actual separation between the problems of blindness, including work for the blind, and the problem of prevention of blindness. I believe prevention of blindness is a public health problem. Work for the blind is a problem of education and rehabilitation among a small group of people who, because they have lost certain normal abilities to do things as the majority of the group must do them, have to be re-educated or readjusted.

Last night at an informal gathering, a few of us talked about the ways in which we might adjust our problem of relief and our problem of public health so that there would not be confusion, but rather efficient co-operation. The most encouraging thing that came out of that little discussion was the expression of thought that to have a well-rounded program of social betterment, the Federal Government should join forces with the states and counties in enlarging the direct relief program into one of medical assistance and even, if necessary, rehabilitation, so that there would be a unified service which would see the problem through from beginning to end.

The Ohio Department of Health is a very responsible organization and has a real function in the field of prevention; the Ohio Commission for the Blind is a responsible organization and has a function to perform which the health department cannot perform because of its organization

and philosophy; the Ohio Department for Public Assistance has its part to play. It may take time, but inevitably we are going to have a program of public welfare which will absorb all the bureaus and departments and commissions, and, I hope, will be so well organized that it can follow a client from infancy through childhood and education, through adulthood and rehabilitation, so that there won't be shifting from agency to agency, with all the lost motion and the expense that result. But such a program depends entirely on people like yourselves; it depends on your joint efforts to help the powers that be, legislators or otherwise, to adopt a reasonable, liberal, sensible program that will permit the kind of service that is necessary.

In conclusion, the Ohio State Commission for the Blind is prepared to give medical service to those who need it. We are going to be prepared within a very few weeks to say definitely, and to know that we are telling the truth, that any client whom a case worker or family worker reports to us as threatened with blindness and utter dependency because of an infectious condition, will be turned over to the state health department or its sub-agency, will get adequate care, or if he is beyond that stage and the health department can no longer be of service, he will be turned over to the Commission for the Blind, or its sub-agency, for rehabilitation —medically first of all, and, if that fails, then economically. If that fails, he is referred to the department of public assistance.

CHAIRMAN WALTER: At the same time I hope your social workers are going to be propagandists.

Mrs. Merrill, were you going to say something?

MRS. MERRILL: I might report briefly a conversation I recently had with Dr. Snow, Director of the American Social Hygiene Association. Dr. Snow was speaking of the funds available at the request of state health officials through the U. S. Public Health Service for public health activities in the various states. This offers a very great opportunity for expansion, and, because of the relation of syphilis to eye defects, we in the prevention of blindness field must take advantage of it to the best of our ability.

In Washington, D. C., on December 28, 29 and 30, a conference is being held of state health officials, state venereal disease officers and social hygiene officials. That conference will discuss present practices for the control of venereal diseases, present educational practices that are being followed, and possibilities for the future.

As I say, what the states will get from the U. S. Public Health Service

depends on how the need is presented to the U. S. Public Health Service by the several state health officers and what they can present as a constructive venereal disease control program in their states. Following that meeting in Washington, Social Hygiene Day will be held on the third of February, the programs being planned locally in hundreds of communities in the country. It is felt by the American Social Hygiene Association that as a result of those meetings, some program may be worked out to serve as a basic plan for the individual health officers who will go before Congress with constructive programs adapted to their own states and ask for a continuing appropriation, matching dollar for dollar, for forwarding the control of venereal disease.

Dr. Snow feels, as do we in the prevention of blindness field, that it is up to those of us in the communities, as Mr. Bartram has brought out, to be aware of the situation, to be propagandists, and to lend our influence as much as possible to make the state health officers request from Congress real support of their programs.

Dr. Rice: I should like to make another statement. You know medical social workers are already being used in the private practice of medicine. When I raised the question awhile ago I wasn't questioning the value of the medical social worker in the clinical practice of ophthalmology. It was the application of the medical social worker to the private practice of medicine, to the patients who come in and pay the doctors' fees. Apropos of that, I believe it is the Massachusetts State Board of Health who has employed a medical social worker to work with the private physician, on request of the physician. It is in the venereal disease program, of course, and for follow up of private syphilitic patients who fail to return to the private doctor for treatment. The State Board of Health is taking that measure for getting these medical social workers to go out and contact the patient, even though he was a private patient who paid the doctor a fee, and to persuade him to return to that doctor, or go to some other doctor, and finish his treatment.

Going a little farther, I hope the time will come when the state departments for the prevention of blindness will possibly change their names, say to departments of sight conservation. Psychologically, such a change would broaden the field of the prevention of blindness. In the future, when a child develops a visual acuity of 20/100, is it going to be reported just like tuberculosis is today in the state health department? Probably he will be reported to the department for the conservation of vision. He may be a private patient if he is from a well-to-do family, but for some

reason the doctor may be afraid that the family doesn't appreciate the danger, or he may want a little help in educating that family. So he will report, with a request for service, to the state department for conservation of vision. Perhaps the contact will be by literature or by correspondence, or, in some cases just as in Massachusetts, the contact will be personal. That was my idea of the use of the medical social worker in the private practice of ophthalmology and preventive blindness.

CHAIRMAN WALTER: Thank you very much, Dr. Rice. I think that is most interesting. I hope that it won't be long before other states develop a similar program to that of Massachusetts.

MR. MILTON H. KLEIN (Ohio State Case Supervisor, Bureau of Aid to Blind, Division of Public Assistance, Columbus, Ohio): The relationship between the Ohio Commission for the Blind and my division is a most welcome one and the tie-up is most helpful. We not only have a statewide nursing program which includes prevention, but—and I may be letting the cat out of the bag—I think one of these days we are going to put on a medical social worker who will also carry on prevention work.

It is very gratifying to hear Miss Boggs speak of case work as she did, since it is to that kind of program that I hope we are committed, and with that approach I am sure that a large percentage of our clients will not have to be kept indefinitely but will be found to be rehabilitable.

CHAIRMAN WALTER: Thank you, Mr. Klein. We are glad to hear from you and to know that is going to be the attitude of your division.

I wonder if anyone else has anything to add.

MRS. E. B. PALMER (Cleveland, Ohio): We have all heard it said that in social work it is only the long views that are cheering. For Cleveland we have two or three statistical figures which I think may encourage us in our struggle. In the twenty years in which the population of Cleveland increased 80 per cent, the blind population increased 26 per cent. In 1920 there was one blind child in the public schools to every 2200 children with normal vision; and ten years later, in 1930, there was one blind child to every 4200 normally seeing children. This result, of course, comes from the very splendid co-operation in Cleveland not only among the medical agencies but all social workers who are alert to their part in the working out of the problem.

CHAIRMAN WALTER: I am sure that Ohio points with pride to Cleveland on various and sundry occasions and wish that we might some day attain the same efficiency.

SECTION III

Forum—Rehabilitation vs. Relief

Presiding: Hon. Henry J. Robison, Chief, Division of Public Assistance, Ohio State Department of Welfare

Forum—Rehabilitation vs. Relief

Presiding: Hon. Henry J. Robison, Chief,
Division of Public Assistance, Ohio State
Department of Welfare, Columbus, Ohio.

Editor's Note.—Because of the fact that much of the discussion during this meeting pertained to other problems than prevention of blindness, we are not publishing the report, but anyone who wishes to see it may do so upon application to the Society where a verbatim report is filed. The topics discussed were as follows:

"Work for the Blind in Ohio under the Social Security Program," William E. Bartram, Executive Secretary, Ohio Commission for the Blind, Columbus, Ohio.

"Rehabilitation of the Blind," Tracy Copp, Division of Vocational Education, United States Office of Education, Washington, D. C.

"Public Health and Social Significance of Eye Disorders," Lewis H. Carris, Managing Director, National Society for the Prevention of Blindness, New York, N. Y.

"Community Relationships and Agency Responsibilities," Edward Jackson, M.D., Denver, Colo.

"Ophthalmological Care," C. E. Rice, M.D., Consultant, Social Security Board, Washington, D. C.

"Selection and Preparation of Personnel," Eleanor Brown Merrill, Associate Director, National Society for the Prevention of Blindness.

"Case Work Technique," Esther McClain, Bureau of Aid to Dependent Children, State Welfare Department, Columbus, Ohio.

General Discussion.

SECTION IV

Eye Health of College Students

Presiding: R. W. Bradshaw, M.D., College Physician, Oberlin College

Teacher Education in Eye Health

Presiding: Franklin H. McNutt, Ph.D., Supervisor of Teacher Training, Ohio State Department of Education

Eye Health of College Students

Presiding: R. W. Bradshaw, M.D., College Physician, Oberlin College, Oberlin, Ohio.

Chairman Bradshaw: This morning's program deals with the field of eye health among college students. By and large, the American college student is a healthy individual, but the more we study health problems in this particular group the more we realize there are definite health hazards that obstruct the college student's progress toward a satisfactory education. Some of these factors which have rather recently come into prominence are questions of defective vision, defective study habits, defective lighting, and so forth. To these problems as they concern college education, we are to give special consideration this morning.

On the program there are five papers, each one of which represents the practical results of a considerable amount of thought and research.

The first paper is a report on "Study Facilities in College Dormitories—The Responsibility of the Administration,"* by J. O. Kraehenbuehl.

Chairman Bradshaw: The next paper, 'The Psychology of Vision," is by Dr. Louise Farwell.

The Psychology of Vision

Louise Farwell, Ph.D., Director of Research, National College of Education, Evanston, Ill.

I really don't have a great deal to contribute to research actually done at the college level, for the type of research which I have been doing in the past eight years has been centered at the elementary and high school levels. I am cognizant, however, of some of the definite problems to be encountered with older students.

This research was originally undertaken at the National College of

*"Study Facilities in College Dormitories" by John O. Kraehenbuehl, Ph.D., Assistant Professor of Electrical Engineering, University of Illinois, Urbana, Ill. Published in *The Sight-Saving Review,* Vol. VII, No. 1, March, 1937. Reprints available upon request.

Education in Evanston, Illinois. In our Children's School we have pupils who come from homes of a high middle class type, who are physically well taken care of, and whose average intelligence as obtained by the Stanford Revision of the Binet-Simon Test is 115 to 118. Even with these positive factors some of the grade children have difficulty in learning to read or spell. As we continued to diagnose and work with these children individually, the difficulty seemed to be caused in part by lack of eye skill

About three years ago I interested Dr. William S. Gray at the University of Chicago in my findings and as a result we started on a co-operative adventure with children from the Chicago public schools who were selected because of reading handicaps, from private schools in other cities, and from the National College of Education.

The battery of tests described later was planned for this research study which we hope will be published during this coming summer.

We have co-operated with ophthalmologists from the beginning, sending them copies of our diagnostic findings which were placed in the hands of the school authorities and parents. They, in turn, have sent us copies of their findings so that at least we have a start toward a better understanding of the medical and educational aspects of the problems involved in reading disability.

Among freshmen attending Dartmouth College this year, there are approximately 646 who were given a thorough medical examination, including the usual eye examination plus tests for aniseikonia and the photographic record of eye movements. The detailed report will be published later by the one conducting this research, but you will be interested in knowing that the range found in speed of reading was from one hundred to eight hundred words a minute. There are three records of men reading over four hundred words a minute. Each record, however, is as different as black from white, because of fixations and regressions of eye movements and evident eye anomalies.

In the particular study which Dr. Gray and I have been making on the psychology of vision, we have given a battery of tests similar to the following:

1. We start our testing with an intelligence test and find that many of the children who have not been successful in school work exhibit a definite emotional blocking which decreases the validity of the findings.

For instance, we tested a ten-year-old lad yesterday who looked like a vigorous sort of boy—a possible football captain in the next ten years—who was very frightened and worried. He repeatedly remarked, "Did I pass the examination? Well now, do you suppose I can come here to

school? Did I get that right?" He was entirely too apprehensive to keep his mind on the problems at hand. To many of these children we give a performance test because language is not as basic to success, and the material is far different from that ordinarily used in school activities.

2. We give school achievement tests in silent and oral reading, arithmetic and spelling. Some of you probably have not seen these tests but they are well standardized and one may obtain a fairly reliable grade placement in each of these fundamental subjects.

3. We include a diagnostic reading examination. Up to date we have used Dr. Marion Monroe's, which we feel is the most interpretive of those available. Probably in the next few years we shall have more efficient diagnostic reading examinations than have yet been published. Dr. Monroe would feel the same way herself, I am sure. We need a very fine test in mirror reading because the children who are not meeting success in reading are often fluent mirror readers. If we could photograph eye movements, for instance, with the card which is being read printed in reverse, I know we should gain some excellent findings.

4. We present an original series of preference tests to determine which hand, foot, eye, and ear the child is preferring, because some of our research data indicate that the child who is straight right or who is straight left does not have as serious a retardation as the child who might prefer the right hand and right foot but left eye and left ear. You might be interested in knowing that in 71 cases we have found only one boy who had a straight left preference, and that about 30 per cent of our cases preferred the right hand, right foot, but left eye and left ear. Some of the specialists at Northwestern University studying hearing difficulties are quite interested in this agreement in preference of eye and ear but disagreement with hand and foot. There seems to be a neurological relationship which will require further study. These preference tests include eight items each for hand, foot, eye, and ear, which have been carefully selected from activities normally carried on by one hand, one foot, one eye, or one ear.

5. We have originated some tests of skill for hand, foot, eye, and ear. Hand skill is tested by using a metal tapping plate which is connected to dry cell batteries and an electric counter. On the metal plate we use different cardboard stencils containing two holes in which to tap; twenty squares; three spools; twelve segments in position similar to the numbers on a clock; or six round holes with one at the base to which the subject always returns after tapping into each of the other five holes as one *and,* two *and,* three *and,* four *and,* five *and.* We allow ten seconds for each hand, counting the total number of taps the child makes with the right

and those he makes with the left so that a ratio can be computed. The child always has an opportunity to improve his score with each hand.

The tests to determine foot skill are similar. We had metal skates made to be strapped on the bottom of each shoe. A bullet-like projection extending downward at the tip of the skate is used as a stylus in the different metal stencils. Ten seconds are again given for each activity with each foot and an opportunity afforded to improve the score if possible. The child is also asked to tap without the skates, touching first one set of thumb tacks placed in a board and then another set, or tapping first with the toe and then with the heel on the same circle.

The tests to determine eye skill include two oral reading tests and the Ophthalm-O-Graph record. A tachistoscope is used with five separate word lists so that the right eye reads alone, the left eye alone, both eyes supposedly simultaneously, and each eye alone again. This is a short exposure device allowing only a fraction of a second to see a line of print. The lists contain 45, 46, or 47 first grade words so arranged into 20 rows of graded width that there is a two letter word at the top and 19 letters and spaces at the bottom. With this short exposure device we obtain the child's ability to read rapidly as well as his directional method of using eyes. Some children read the word at the right before reading the word at the left. Others will read only portions of words.

We use the Gray Oral Reading Check Tests for the second test, having the child read the first sheet of whichever set is selected, with the preferred eye, the second sheet with the non-preferred eye, the third with both eyes, and the next two sheets with either eye alone again. As the child reads, the examiner records all errors and the time consumed in the reading and later divides the data into four catagories. We have found children who will read better with either eye alone than when the two eyes are working together. Of our 71 cases, 32 per cent have poor binocular co-ordination, of varying degrees. The eye specialist might not have found anything wrong with the eyes as organs, yet from a functional point of view there was definite difficulty.

In regard to the Ophthalm-O-Graph we have analyzed many records taken of these children and now have accumulated three or more records for many of the cases. Dr. Gray photographed the eyes of our college freshmen a year ago and found that 15 per cent were reading at the fourth and fifth grade levels according to standards of words read per minute, number of fixations and regressions for every 100 words. He also observed that many students over-converged their eyes at the beginning of each new line of print.

We have no reading materials available which would be suitable for college students to read aloud with first, one eye and then, the other, etc.; but from my experience with children I should welcome the publication of such material as a basis for research on binocular co-ordination. My approach until now with college students has been to give them one form of a standardized silent reading test with one eye reading, another for the other eye and, if a third form were available, to give that for both eyes. One woman read 50 per cent better with one eye than the other. The eye specialist had not recommended glasses since his examination did not warrant them but the habit which this subject had of holding her head while reading so that only one eye could be used had interfered with correct functioning of her eyes.

The test to determine ear skill has five lists of thirty pairs of words, each selected from the Horn kindergarten list. Ten of these pairs are of similar words while the others are different either at the first sound, the last sound, or somewhere in the middle. The child uses one ear first and after listening to the pair tells the examiner whether the pair is alike or just where the difference is. He then has a test for the other ear, for both ears, and for either ear alone again. The hearing of one ear is partially blocked with cotton moistened with alcohol and more cotton laid onto the outside of the ear. This test is not timed.

6. We test the child's eyes with the Telebinocular, DB Series (Keystone View Company) as a check on the Snellen chart. From this series of cards we obtain data on visual acuity of both eyes in comparison to that of either eye alone; suppression of vision; poor or satisfactory fusion at the far or near points; muscle imbalances; good or satisfactory stereopsis; and astigmatism. With these findings we can weed out much more efficiently the cases who need the eye specialist than when we had facts on visual acuity from the Snellen chart alone. I know that since using the Telebinocular we have sent a definitely higher percentage of children to eye specialists and that more of our children are wearing glasses than before. I am merely telling you this because I am very sincere about it. The experience we have had in the past three years of using both the Snellen chart and the Telebinocular makes us quite enthusiastic concerning the latter as an efficient instrument to use in schools as a weeding out process. So much for diagnosis. What about our findings?

The types of cases might be catagorized into four groupings: psychological, educational, physical, and neurological or physiological, although of course there is bound to be overlapping.

The children characterized as psychological problems are: (1) those

we find with low mentality who have been usually forced to read before there was sufficient mental maturity; (2) those with definite emotional blockings where some experience or idea has conditioned them negatively toward reading, even from the initial stages of learning; (3) those who have little inner drive, who are not ambitious for themselves, who have extremely poor work habits; and finally, (4) those whose negative attitudes towards and non-interest in sedentary activities affect their learning.

The pupils known as educational problems have come from overcrowded schools where 50 or 60 children are herded into one room so that no individual instruction is possible when it is needed or no attention paid to individual interests; have had inadequate methods of reading with no emphasis on correct directional movement; poor teachers who know little about efficient eye habits or causes of reading and spelling disability; have had improper lighting and seating in their schoolrooms and lack of sufficient activities to arouse a natural urge for learning.

The children who represent physical problems are: (1) those allergic to this or that and who suffer a great deal from asthma (It is my general impression that these children's eyes are uncomfortable. They tire easily and do not sleep very well); (2) those disturbed because of glandular anomalies of the thyroid and pituitary glands; (3) those with very poor motor co-ordination; (4) those handicapped because of eye difficulties, such as muscle imbalances. We are using the rotary prisms with the Metron-O-Scope (American Optical Company) to recondition eyes to better balance of the eye muscles. It is a machine which stands about four feet high and is about three feet wide and one foot deep. There are three yellow shutters. You put in a roll containing reading material just as in the old-fashioned player piano. First the left-hand shutter exposes the print, then the middle, then the last. The speed of the machine can be regulated so that one can read 15 to 50 lines a minute. This machine forces the eyes to read from left to right, the directional movement of eyes which many children do not have, and reduces repetition to a marked degree.

In testing eyes for muscle imbalances with the rotary prisms, the child is seated in back of the rotary prisms while the middle shutter of the Metron-O-Scope is open, exposing one word or a number. The prisms are set for diplopia with one prism set at four diopeters up and the other four diopters down. If the child says that one word is directly above the other it is assumed that there is no esophoria or exophoria, but if one word is at the right or left of the other word one of the prisms is turned so that the amount of esophoria or exophoria may be determined.

Yesterday I worked with an eighth grade girl who is a very slow reader. The word, "Mediterranean," happened to be in the middle shutter. She said she saw the last *n* of one word above the first *e* in the other. The specific reading of the prism was 12Δ before one Mediterranean was above the other.

Since I have been working with Dr. Gail Soper in Evanston, as well as many other doctors, I explain my findings to the doctor and the parents, and then start the training under the advice and guidance of the eye specialist. If orthoptic training with the rotary prisms, plus the Metron-O-Scope are required for this particular girl, I want her to have them soon because next year she will be going off to high school where there will be no provision for this correction. We have discovered many children with similar muscle imbalance. There are also other eye anomalies, such as suppression, types of amblyopia and poor fusion, or children with low duction ratios who are helped by the above techniques.

I worked with a child recently who was reading to about 67 per cent of his capacity. The amount of abduction and adduction he could take was a ratio of one-quarter, but only two diopters, base in, to eight diopters, base out. When you watched his eyes in the reading process there was almost no motility of the eyes whatsoever. The Snellen chart or the Telebinocular had not shown any anomaly and the eye specialist who examined the boy recently said he had found no need for a correction. Yet a careful check with the prisms and an Ophthalm-O-Graph record indicated almost wooden eyes and extreme immaturity of eye movements.

This boy needs some correction which will force his eyes to move efficiently. I am going to experiment in the future with the Tel EYE Trainer (Keystone View Company) with cases of this type, if the eye specialist approves. This instrument stimulates the left eye, the right eye, both eyes, and has many avenues of approach toward efficient binocular co-ordination. To obtain the best results the boy must face the facts, must co-operate to the best of his ability, and be convinced that he needs more stimulation of eyes to the brain than more reading from a book would give.

If these eye difficulties are found in children there must be many similar problems at the college level.

I am working now with a boy who is a freshman in high school. He has an alternating strabismus of the divergent type. When we started our treatments, Dr. Soper felt we should have the prisms set for diplopia to force reading from each eye. Although this student has very fine scores from reading tests he had a difficult time at first reading from the Metron-O-Scope in this manner. The eyes moved so ineffectively that it was

difficult to tell with which eye he was reading. When we started with the prisms, base out, we had to move the prisms out 24 diopters with each prism before this boy saw singly. It took seven or eight treatments before we could gradually bring the prisms back to zero, continually checking to make sure he was not reading with just one eye—his habit for many, many years. Now the boy can see singly at zero and has had many treatments with the prisms set at five and six diopters, base in. As you would expect, he saw double for many weeks at the beginning, especially when using his eyes for close work, but since the fall he has not mentioned seeing double. One of our main reasons for helping this boy lies in the fact that although he is a good reader, he spells very poorly, retaining through seventh and eighth grade a low sixth grade spelling score. Definite improvement in spelling as well as decided improvement of the eyes is being noted.

I want to state a few of the physiological and neurological handicaps. I have already given you the hint of the results of mixed preference of hand and foot with eye and ear. We have encountered some cases where one eye is preferred so constantly that the vision of the other eye is almost entirely suppressed. The brain is apparently not working with this eye. We have given individual instruction for almost a year to a girl who has had spastic paralysis. She could not read with her left eye at all when we started our treatments. It took about four months of reading rolls with the largest print and sitting very close to the Metron-O-Scope before she could read at all fluently with the left eye. Last June, the oral reading tests indicated that she read twice as well with the left eye as the right, or both. Now we are endeavoring to force the two eyes to work together by giving her base out and base in prism reading and are gradually getting a better ratio and a larger amount of diopters. In fact, we have accomplished a 24 degree base out.

There are other neurological and physiological problems as brain injuries, encephalitis and sex differences, but I shall not have time to discuss them. All I can mention is that there are four times as many boys as girls who have reading handicaps.

In conclusion, may I say that this study of psychology of vision points to the fact that about one-third of the disabled readers have poor binocular co-ordination because of suppressed vision, lack of motility of eyes, muscle imbalances of varying amounts, or inadequate fusion and undoubtedly aniseikonia, and that these children need definite orthoptic training with all available equipment instead of reading from books which is undoubtedly the least efficient method of correction.

We are hoping to study more cases in the future and some of the men at the University of Chicago are now computing statistical calculations on our data. It looks as if non-success in reading and spelling is partially caused by a lack of binocular co-ordination during the reading process which the eye specialists have not yet discovered. We do need to work together on this problem in the near future so that a smaller number of children and adults will meet non-success in their academic careers.

CHAIRMAN BRADSHAW: The next paper is "Changes in Students' Vision during the Four Years in College Life,"* by Dr. Ruth Boynton. The next paper, "College Administration of Student Eye Health," is by Dr. Robert McCormick.

College Administration of Student Eye Health

ROBERT N. MCCORMICK, Ph.D., Professor of Physiology,
Ball State Teachers College, Muncie, Indiana.

This paper reports observations from 20 Indiana colleges and universities. It deals with administrative practices and conditioning factors of student eye health. Visits were made to representative campuses. Officials were interviewed. Letters were sent to selected individuals in positions of responsibility. It represents a limited survey made during the fall of 1936 by a college hygiene instructor. Even though the evaluations can be only tentative, student eye hygiene is of enough present and future concern to justify attempts at seeing it as it is. This involves an appreciation of the tolerance and adaptability of human eyes as well as questions of relative values.

The following schools were contacted:

Anderson College and Theological Seminary, at Anderson;
Ball State Teachers College, at Muncie;
Butler University, at Indianapolis;
Central Normal College, at Danville;
Depauw University, at Greencastle;
Earlham College, at Richmond;
Evansville College, at Evansville;
Franklin College, at Franklin;
Goshen College, at Goshen;

*"Variations in Visual Acuity Among College Students," by Ruth E. Boynton, M.D., Director, Students' Health Service, and Associate Professor of Preventive Medicine and Public Health, University of Minnesota, Minneapolis, Minn. Published in *The Sight-Saving Review*, Vol. VI, No. 4, December, 1936. Reprints available upon request.

Huntington College, at Huntington;
Indiana Central University, at Indianapolis;
Indiana State Teachers College, at Terre Haute;
Indiana University, at Bloomington and Indianapolis;
Manchester College, at North Manchester;
Marion College, at Marion;
Notre Dame University, at South Bend;
Purdue University (Agricultural and Engineering), at West LaFayette;
Rose Polytechnic Institute, near Terre Haute;
St. Mary's College for Women, near South Bend;
Wabash College, for men, at Crawfordsville.

Of the above, Goshen College only was visited. Evansville, Marion, Rose Polytechnic Institute and St. Mary's colleges were not personally seen. To the others, trips were made and data received from administrators in response to letters. This list includes over two-thirds of all centers of higher learning in the state. Further, it touches the physical equipment of a much larger fraction of the total college student body. The colleges are widely distributed over the state. In point of age, buildings range from those with over 100 years of use to incompleted ones. Two institutions are almost entirely centralized, each in a relatively new building of stone. Others, of comparable enrollment, occupy many and varied types of buildings. Extremes as to outlay are shown by a range from a $1,000,000 library at one college to very limited or temporary quarters in others. In addition to the four co-educational, state-supported schools, there were two men's schools and one school for women, one private engineering institute, and arts colleges or universities supported by an even dozen separate church groups.

Of the 16 institutions visited, not all were given comparable consideration. The attempt was made to get the salient features of the lighting picture in the time available. Those interviewed included: presidents, comptrollers, superintendents of construction or of buildings and grounds, deans of women, a principal of a training school, classroom teachers, and residents of dormitories. As a basis for things to look for, in part, four standard forms from the National Society for the Prevention of Blindness were used. Data indicated for the survey of a classroom were under the following headings, each of which was further subdivided: plan of room; color and reflection factor in per cent; blackboards; windows; shades; lighting unit; source of glare; horizontal illumination; and range of foot-candles on work. The data noted for the study room evaluation were similar. One extra heading for a laboratory room listed questions as to work places with a minimum of 10 foot-candles for microscope use, dis-

section, chemical tests and physics experiments. Special features in the library survey blank concerned the fixtures for general lighting and table lamps.

Letters of inquiry went to executive officers (presidents and deans of instruction) and to directors of health services. It was suggested that, as light intensity and related statistical findings can present only a part of the picture, individual responses be made to numbers one and two, at least, of the following questions. They were formulated by Dr. Anette M. Phelan, staff associate in education of the National Society for the Prevention of Blindness.

(1) What steps has the college taken to find the status of eye health and eye efficiency of its students?
(2) What has the college done to give the student an appraisal of his own eye health and to let him know how he may secure and maintain an optimum efficiency?
(3) What per cent of work places in the library have a minimum of 10 foot-candles of daylight? Artificial light? (Work places at library tables only.)
(4) What per cent of work places in the library leave the student free from glare, sunlight, artificial light?
(5) What is the window arrangement in the library? On how many sides of the room? What is the height at the top of the window and the width of the room?
(6) What per cent of dormitory rooms have 10 foot-candles of artificial light on the work tables?

Replies came from 16 of the executives and, in addition, from one dean of women. She, at the request of the college nurse, made a personal study with, and recommendations to, 20 women students in a dormitory. Six physicians, counting two medical school deans replied. Several of these showed collaboration, but there were evident differences of opinion, in a given school staff, regarding the status of lighting and vision conservation. Twenty-three written replies were received, representing 20 schools. A few schools have electrical engineers or others especially interested in various aspects of school illumination. Several officials, where no survey had been made, expressed a desire for one and for practicable recommendations. On the other hand, a lack of acquaintance with a light meter was occasionally manifested by those not specifically in charge of buildings.

Excerpts from letters, first with special reference to students, follow:

(1) "To date we have done little in studying the problem . . . except in cases where there was a noticeable defect. In this event the students were referred to specialists...In orientation and

hygiene, we attempt to point out to the students good practices."

(2) "An annual physical examination of all students. One lecture a year on subject. Follow up by health department in the college."

(3) "Nothing systematic has been done. Some attention is given to the matter in certain of the education courses, but more particularly with the view of fitting the teacher for future work in the classroom than as an aid to the eye health."

(4) "Any deficiencies found in the eye health of any student are immediately reported to the student and, if necessary, to his parents, and he is asked, if it is thought advisable, to consult an eye specialist."

(5) "We employ specialists in eye, ear, nose, and throat. It is my understanding, however, that the examination would not be sufficiently complete to uncover all sorts of eye trouble. The physician would undoubtedly detect serious eye trouble and the student would be advised to consult a specialist for correction of the difficulty."

(6) "Student is told what is wrong, what will correct it, and why, by college physician."

(7) "None. This applies to the medical student."

(8) "I find many students coming to the dispensary complaining of headache and blurring vision. On investigation I find that many of these students read lying down or with insufficient or poorly placed light."

(9) "Certain incidental demonstrations in class. We consider eye efficiency and lighting problems in our educational courses."

(10) "Admission from family physician—examination by college physician assisted by an eye, ear, nose and throat specialist. Incidents are numerous in which eye correction or necessary attention to nose or throat results from these examinations."

As to library illumination and glare, the following reports were received:

(11) "Our lighting conditions in the buildings, particularly at night, are not good."

(12) "The whole building is comparatively new and is well-lighted by sunlight and artificial light. There is no glare in the library."

(13) "Lighting of library, both artificial and natural, arranged upon a scientific basis and has been tested by experts."

(14) "I have not observed the artificial lighting closely."

(15) "Glare can be avoided in every case."

(16) "Very small per cent—have a minimum of 10 foot-candles. About 20 per cent free from glare."

(17) The next reports 60 per cent work places have a minimum of 10 foot-candles and 50 per cent have glare.

(18) Another reply indicated a slightly better per cent for intensity (than one listed as number 17), and also for glare, as based on a survey.
(19) One reported 100 per cent of library places with a minimum of 10 foot-candles with artificial light.

Incidentally, with reference to the one reported as number 19, another person found only a few table lights in the three reading rooms and the most common candle power reading was five or six foot-candles.

Few reports were made as to dormitory lighting intensity. There were found, in college allowances for bulbs, a variation from 60 watts for a room shared by two students at one place, to 300 watts per room, at another. A great variation of lamps, furnished by the individual and by the institution, was seen. Use of I.E.S. student lamps was encouraged in places. Rarely were libraries equipped with local lighting facilities—table lamps. A number of protests were made against glare in terms of "too much light." Laboratory work tables with illuminations up to 50 foot-candles often adjoined recitation-lecture rooms with, at best, three or four foot-candles of artificial light.

The antiquated and the modern were often found on the same campus, sometimes in the same building. Even relatively new structures may not be wired to carry the load now required for minimum illumination. The cost of rewiring seems prohibitive to many. Not always has the value of frequent cleaning of bulbs and reflecting surfaces been seen. Needs are often realized, but officials are faced by a conflict of values, and are affected by the attitude of the instructors toward the use of the available physical equipment as well as by their efforts to secure a more adequate environment. Even in newer school buildings some stylistic competition was noted between the "monumental" and the more utilitarian. Individual beliefs and school standards regarding both illumination and conservation of vision varied widely. Many administrators are light-conscious, but there is a real need for a greater appreciation of diffusion of light in terms of student eye health.

CHAIRMAN BRADSHAW: The next paper is "Eye Health Problems of College Students," by Dr. L. M. Hickernell.

Eye Health Problems of College Students—A Progress Report of a Study by the New York State Student Health Association

L. M. Hickernell, M.D., Professor of Hygiene,
Syracuse University.

We in the educational institutions of New York State thought we had pretty good light and thought the matter of eye health was being fairly well taken care of by the Student Health Organization, but we were rather sharply disabused of our notions by Dr. Phelan. As a result of her paper and the discussion that followed, it was voted that a committee be appointed to study eye health conditions in the institutions for higher learning in New York State, and I was appointed chairman of a committee to make a survey of representative institutions.

It seemed desirable to take at first certain "sample" institutions for study. For this purpose we tried to take a large one, a small one, a men's college, a woman's college, a state-supported institution, and a privately endowed institution, etc. We think we have a fairly satisfactory sampling of the general situation. I can't tell you how many hundreds of colleges and universities there are in New York State. Our committee could not, even indirectly, study them all. The ones thus far studied are Rochester University, Colgate, Syracuse, Cornell. We are about to start operations in Vassar College, in Poughkeepsie, and later in the spring we hope to get into Russell Sage College, in Troy, New York.

We have found quite a number of interesting things in our studies. First of all, we have many problems in connection with the varying types of buildings that are found on the campus—the old and the new—as has been brought out in some of the other papers this morning. We have a certain few problems in connection with our administrative officials who do not yet appreciate the importance of adequate seeing aids.

Those who have interested themselves with us in this study are very glad to make the discoveries about their individual institutions, and in returning the original data sheets, I find that they uniformly say to me: "When you have worked these up please return them because, as you will observe, we have found some bad spots in our situation and we want very much to correct them." This, after all, is the main object in making the survey.

In connection with the arrangements for this study it was postulated in the first place that it was to be a co-operative enterprise between the

National Society for the Prevention of Blindness and the New York Chapter of the American Student Health Association. In the second place, it was agreed that the information obtained through the survey was to be confidential in the sense that the name of no university should be used in reporting our findings. Consequently, in anything that comes out of our studies in the way of publications we do not propose to mention the college or university concerned by name.

We have found in practically every instance that certain matters need correction. There are some situations, such as were alluded to in the last paper, where rewiring will be necessary. This will involve the expenditure of a considerable amount of money, a real problem for such institutions as that from which I come, since we are very poor and do not know when we shall be other than very poor.

We do, however, in spite of poverty, find a very definite interest on the part of those concerned—the grounds and building people, on the one hand, and the housing bureaus of the deans' offices, on the other. Not the least that has come out of the survey, of course, is the presentation of lighting as a problem to those who heretofore did not actually realize how much of a problem it was. We are expecting quite a number of things from the data that we are uncovering.

The data sheets we used are modifications of earlier ones made by the committee of the Illuminating Engineering Society. They contain the usual information relative to foot-candles, glare, types of lighting units, and so on. We try to adapt these for dormitory room, library, laboratories, and so on.

We hope before the end of this academic year to be able to present a complete report of our findings, and I personally think, after hearing two of the preceding papers, that there is someone in the background planning the various phases of this general study, because I see how these different things are going to go together to make a completed whole, which will further the status of eye health in the educational institutions in the country, and indirectly, of course, through them, among the population generally.

I look forward to continued pleasure in connection with the further course of this study.

Discussion

CHAIRMAN BRADSHAW: This morning we have covered much ground in connection with visual defects and the effects of college work on students' vision, and I am sure many of you have questions that you would

like to ask. We have here individuals who can answer these questions authoritatively, and I hope that now we may have a discussion of the papers that have been presented with questions that may have occurred to you during the reading of the papers. We have a reasonable length of time I think for this discussion.

MR. ROWLAND PRESSING (Ohio State University, Columbus): I should like to ask Dr. Kraehenbuehl whether the equipment he showed is generally available and whether he thinks it would be desirable to use in connection with demonstrations.

DR. KRAEHENBUEHL: The equipment is cheap and is available any time. The tape measure is an ordinary cloth measure, worth about 65c. The folding rule is worth about 15c. An architect's scale costs about 40c to 60c. The triangle is worth about 25c. The forms, if you run them on the mimeograph with a stencil, cost about 20c. You can run about 2000. The paper costs very little, so the forms are a small part.

A foot-candle meter of this type, a small type, which is perfectly satisfactory, is worth about $12.50. Nela Park will be glad to give you the color charts. The New York Testing Laboratories will send you a handful of reflection gauges for nothing.

As to the rest of the material, it consisted merely of photograph, the classification material, a closet photograph of four or five pictures, 25c or 50c apiece; it depends on what you are photographing.

The box itself didn't cost more than $2.50. All totaled, there isn't more than $15 or $16 worth of material, if you use the smaller meter. The larger meter costs $20, but as I stated before, I am much more pleased with the smaller one because you can use it for so many purposes for which you cannot use a larger meter.

MISS PAULINE B. WILLIAMSON (Metropolitan Life Insurance Company, New York City): A question has come up as to whether eye examinations should be required as a preliminary to research work.

CHAIRMAN BRADSHAW: Will someone volunteer to answer that question? I wonder if Dr. Phelan couldn't answer that better than anyone else.

DR. ANETTE M. PHELAN (National Society for the Prevention of Blindness, New York City): Dr. Bradshaw, I run across the same question in many institutions where research is being carried on. After the students have been engaged in research for some time, they complain of headaches and seem to need the attention of an ophthalmologist. The deans of the graduate schools repeatedly ask me, "What is the trouble here?

Does this mean that before anybody is permitted in the field of research we should see that he has an ophthalmic examination?"

In one of the schools in Cornell University, for instance, the School of Engineering or the School of Architecture, no student is allowed to register until he has had a complete ophthalmic examination.

I can't answer the question Miss Williamson raised, but I am very eager that we should be able to answer it. It may be that we need to select on the basis of an eye examination. It may be that we need to pay attention to the conditions under which students work. If this morning's reports indicate a fair sample of environmental conditions, we might readily suppose that one of the factors in the headaches of people in research is to be found in the environmental conditions of the libraries and the study rooms on the campus.

Dr. John M. McCleary (Muskingum College, New Concord, Ohio): I think the questions I had in mind have been pretty well answered, but I should like to know more about the Telebinocular. I am afraid I am grossly ignorant. I wonder if Dr. Farwell will tell us a little more about it, whether there are great technical difficulties that would make it hard for an amateur to use the Telebinocular, the expense involved, and possibly the time consumption involved in the use of it. Many of us are so busy with other things, or think we are, that we have a feeling we don't have time for such things, and we should take time if it is at all possible.

Another factor some of us need to consider is our distance from a well-trained ophthalmologist. I happen to be working nine miles from a man who is doing any ophthalmology at all, so I think we have problems some of you do not have. This Telebinocular may help us. I should be interested in knowing more about it.

Dr. Farwell: From our experience, we think too much emphasis has been placed on tests for vision only. The Telebinocular gives you vision of the two eyes, the left eye alone and the right eye alone, but as you test, both eyes are kept open and if the child is suppressing the vision of one eye, he just doesn't see the dots at all. You have to force that eye by covering the other to obtain the vision that is there, just as you do when testing vision with the Snellen chart. One couldn't catch this suppression except by giving a test similar to the Telebinocular.

Through the use of the Telebinocular it is possible also to obtain some data on fusion at the far and near points. The instrument may not be absolutely correct and possibly something better will be devised in the future but if slow fusion has any bearing on ease and speed of reading, we should be able to test for it.

The instrument also tests for depth of vision—not 100 per cent but at least up to 40 per cent which is a tentative norm for the average person. We also obtain data on muscle imbalances of the esophoric or exophoric type and whether there is any hyperphoria. The cards checking astigmatism seem to be particularly valid. For instance, from our experience when we have used the Snellen chart from the first grade through the sixth or eighth grade, we did not pick up children who, when later tested with the Telebinocular, showed symptoms of astigmatism. The eye specialists have discovered serious conditions in some cases.

This testing can be accomplished in 10 or 12 minutes except with very young children when it may take 15 or 20 minutes.

One of the representatives of the company spent four or five hours at different times with me demonstrating the use of the machine and then two or three of us on the faculty got together to experiment. Personally, I think anyone trained in the giving of tests ought not to have any difficulty with the Telebinocular. It is probably the interpretation in which some people used little judgment, that provoked a misunderstanding between the school and the doctors.

All we do is to report to the eye specialist that we have tested the child's eyesight with the Telebinocular, listing some of the findings, and stating that a thorough examination is advised. I have used the instrument for weeding out entirely and do believe that its use is getting away from the idea that visual acuity is the one and only item to test.

DR. PHELAN: Has the ophthalmic examination supported your Telebinocular findings?

DR. FARWELL: Almost entirely. I haven't exact data, but if we have felt that something was radically wrong with the child's eyes, I should say that 80 per cent have come back with a correction.

I gave a lecture two or three weeks ago before the ophthalmological group of Cleveland, and one man said a brother of his, principal in the high school, had given some three or four hundred examinations with the Telebinocular, and in 98 per cent of the cases where they had been suspicious of eye trouble, the patient had returned from the ophthalmologist with a correction.

Dr. Gifford in Chicago is working on research with his examination in comparison with the Telebinocular, and I hope he will publish his results.

Someone was just telling me that in Cincinnati they tested some six or seven hundred children with the Telebinocular. If it isn't the Telebinocular, it ought to be some other instrument which will give us more information as to the condition of eyes than merely visual acuity.

DR. HICKERNELL: What does it cost?

DR. FARWELL: About $60.00 or $70.00. Our machine has paid for itself many times over in human interest.

CHAIRMAN BRADSHAW: Dr. Schonwald, would you say something about the practical use of this in student health service?

DR. J. D. SCHONWALD (Health Service, Miami University, Oxford, Ohio): I think the state association and probably the individual health services should start a definite program relative to systematic methods of investigating the eye health of college students.

I think the problem divides itself into two parts. The first is lighting, which has been discussed here, and the second is the eye defects of the children themselves.

A rather haphazard method is in vogue in most health services. I know that is so in ours. We make a routine Snellen chart examination of all entering students. By doing so, we are able to pick up only the myopes and the cases of high astigmatism—in other words, those with defective vision. Fortunately, we are able in our health service to correct these very quickly. Practically all of these are corrected, so far as we can induce the students to have correction made. The work is done by the student health staff. The hyperopic student is not found by this type of examination.

At Miami we have the freshman advisory system. We have been discussing the use of a Telebinocular to be placed in the hands of the various student advisers, so that they may examine the eyes of students in these groups, turning in the reports to me at the health service.

We are contemplating the purchase of one or several of these Telebinoculars to be used around the campus by these groups. The department of psychology is also very much interested in the use of this instrument for their classes, and I think from the educational standpoint that will do a great deal to make the student body conscious of the skill that is necessary to use their eyes together, as well as simply calling attention to actual defects in eyesight itself.

CHAIRMAN BRADSHAW: Are there further questions?

DR. EDWARD JACKSON (Denver, Colorado): May I say one word about the Telebinocular?

Vision is not only the focusing of light on the retina with the retina receiving the proper impression; it is an enormously elaborate co-ordination of the light impression with other brain actions. Now, the Tele-

binocular goes back of the eye to the brain co-ordinations and in that way is opening up a new field for education.

Dr. Laura Zirbes (College of Education, Ohio State University, Columbus): I would like to suggest that instead of making it possible for children to study harder we recognize that the young child's eyes should be protected by far less close work. Doctors don't support us in that very much and school authorities don't support us in that very much.

Ever since Dr. Gray and I were working in Chicago on the problem of diagnosis we have had great difficulty in getting any kind of reasonable attention for the child with a slight visual defect. We send them to a reputable oculist and they will come back and say the vision defect is slight and the child doesn't need glasses.

In setting up clinical groups for the summer demonstration schools, it is only this year I was able to convince physicians that, as school people, we were not just interested in whether a child needed glasses, but in what his educational experiences would do to his subsequent vision development, and we wanted to know about any defect which would suggest that we postpone reading, for instance, or that we limit reading periods to ten minutes. That is the kind of observation that shows when the strain begins to be in evidence. It seems to be far more significant than merely a matter of fixing the eyes up and getting the matter off our minds.

It is more or less a continuous process of seeing when the eyes are rubbed, how often the child turns his head, and, much more deeply than that, a problem of revising the childhood education curriculum so that young children do not do much close work with their eyes, even though they can. It is not a question whether they can, but whether they should.

We can teach children to read at seven or eight, so by the time they really should have their noses in books they do it with far less strain. Instead of that, we spend as much as two hours a day with little five- and six-year-olds, whose fusion problems are increased by that amount of attention to fine work. The little people go ahead and do what is expected, if you make them do so, even if it does ruin their eyes. I think some of the college problems are to be tackled way down in the beginning of school. I know my own case was like that. I was nearly blind as a child because I couldn't see. I went to one oculist after another and they said it was imagination. They lacked the imagination required to see what happened when a person who could see by straining, could not carry the strain for hours and days and weeks on end.

Chairman Bradshaw: Is there further discussion or questions?

Dr. Lee H. Ferguson (Director, Health Service, Western Reserve University, Cleveland): I have a couple of questions, and I might say something, too, about Dr. Boynton's paper. I will say that first.

I think, Dr. Boynton, your tests were made at entrance to college and then not given until the senior year. It is possible that if intermediate tests had been made some of the defects might have been corrected earlier. The tendency of college students, if they are once fitted with glasses, is to think they are effective indefinitely. You have to convince college students that the problem is not settled, that vision is never static. The yearly examination should be stressed as an absolute minimum, and should be a part of the routine of every health service.

We are fortunate at Western Reserve in having had the trustees pass a requirement for a physical examination every year, including the eye examination. We have found many, many students who within the year have had a change in vision. We find this particularly in their first year. When they come to college there is a nervous strain because of the changed conditions. The second examination after they enter college is of tremendous importance, both from the standpoint of eyesight and their general physical makeup.

There is no doubt that the Snellen test is a coarse screen, as Dr. Boynton brought out. In the development of health service work we must start with the coarse screen and then go to finer screens. At one end is the complete ophthalmic examination and at the other end is the Snellen chart. If the Telebinocular has given us an intermediate, inexpensive type of examination, I think it will be a godsend to us.

If its use demonstrates that a considerable number of serious visual defects are missed each year by the Snellen test, then we would have a good argument for going farther and doing a complete ophthalmic examination on each student. This would be the ideal solution, but is something many of us must leave to the future.

I have been asked two questions. Is a college justified in obtaining an ophthalmic examination of students on entrance? That means a complete ophthalmic examination, I take it.

I think in our present status we can say that, because of the expense, unless the college can provide the eye specialist to make the examination, we probably could not require it. It is certainly our responsibility, however, to use the ordinary tests to pick up the most urgent cases and eventually to develop a method which will discover defects like hyperopia and astigmatism which cannot be detected by simple vision tests.

Is the college justified in leaving this question of examination to individual initiative and physical discomfort?

Absolutely not! We have gone a long way from that attitude—to wait until something serious happens before we meet a diseased condition. Now we go out to discover a diseased condition before it becomes serious, before it declares itself in such loud tones that anybody can hear it.

We go out to meet tuberculosis when it is a tiny spot as big as the end of your thumb, and we must go out to meet these eye conditions by every means at our disposal so as to detect them early and not let them develop until they become serious.

CHAIRMAN BRADSHAW: Before we close this meeting, I want to express, in behalf of the Ohio Student Health Association and everyone here interested in student health problems, our appreciation to the National Society for the Prevention of Blindness, and especially Dr. Phelan, for making possible this most stimulating and instructive program.

Teacher Education in Eye Health

Presiding: FRANKLIN H. MCNUTT, Ph.D., Supervisor of Teacher Training, Ohio State Department of Education, Columbus, Ohio.

We are gathered here this afternoon to talk over the possibilities for an effective teacher preparation program.

There are in Ohio alone 46 teacher training institutions. Some of them, of course, are very large and have all the facilities that are necessary for an effective program in eye health. Others are quite small and are located in remote districts. Such institutions are rather out of touch with what is going on. They have neither the facilities nor the information nor the source material essential to an effective program.

I am happy that so many engaged in teacher preparation are present today to hear the problem outlined. Really, many of us are unaware that there is a problem, and certainly the first step toward a sound program is such an awareness. I say this without prejudice to those of you in the special fields. Of course, you have known the problem and have long been struggling toward its solution.

Miss Reba Harris will be our first speaker and will give us features of eye health problems in public schools. I am happy to present Miss Harris.

Some Eye Health Problems in the Public Schools

REBA F. HARRIS, Associate Director, Bureau of Public Health Education, State Department of Health, Louisville, Kentucky.

In this day of social diagnosis through research studies, many states and communities are bringing to the foreground problems which involve the fullness of living for a greater number of human beings. As such problems are brought out into the open, communities everywhere are looking upon their solutions not as stumbling blocks but as challenging adventures. Observed from a national or state viewpoint, it is evident that many areas are uncovering problems which are similar in nature. On close analysis, each locality or group is found to be solving its problems in the light of its own abilities and manifest needs. Sometimes these efforts seem faltering and slow to those who view the wider panorama of events. Often groups with this broadening vision set up an academic standard and individual communities, regardless of needs or abilities to solve their problems, are judged by this one standard. It is growth and progress, not the attainment of a set standard, which should be used as the measuring rod.

As we look into the public schools throughout the country today, we cannot say that all schools, or even a large part of them, have reached the standard commonly designated as "progressive education," "child centered," or "child-activity." We can say that in almost every community, we find evidences of a changing point of view in reference to the needs of children. Parents and communities are demanding better educational opportunities. Within the school system itself teachers are at work on the revision of the curriculum. Gradually we are beginning to believe that the major function of public education is to guide the child to learn how to live better within the environment in which we find him. How to use this environment, which includes physical factors, people and events, for the fullness of individual and group living is the challenge for every child.

Visual needs are paramount wherever children are grouped in classrooms. Through the study of eye health problems in the public schools, we are paving the way for a better understanding of children. By means of such studies we may guide children to learn how to live better.

One of the first problems relating to the eye needs of children is the awakening of public school administrators and classroom teachers to the realization that visual needs of children are intimately interwoven with the learning processes and, as such, are not to be considered as isolated health

problems to be pointed out by the health official or school nurse. In this day of widespread knowledge, it seems trite to state that eyes are essential to learning. Authoritative sources point to the fact that approximately 87 per cent of all the impressions which reach the brain go through the eye. A study of an average day at school reveals that a large part of the child's time is spent in gaining information which requires close eye work in an insufficiently lighted classroom. Enjoyment and skills in play activities on the school grounds may be conditioned by visual difficulties. Even the extent and progress of the child's learning at school are determined largely by tests and measurements which demand the use of the visual mechanism.

And yet, how many classroom teachers know how to study eye needs of children? How many school boards and administrators consider it their responsibility to provide teachers with eye testing materials and adequately lighted buildings? Too often the results of the Snellen vision test, with its limitations and its hurried use by the public health nurse, serve the teacher as the only indication of eye difficulties of the pupils. Through the trial and error method, the teachers fight against the forces of nature in their efforts to guide children to learn.

In an approach to this problem in the public schools of Kentucky, it was found that a law on the statute books required all classroom teachers to test annually, by use of the Snellen eye chart, the eyes of all pupils. There was no provision for teacher education or supervision in this testing. The county public health officers considered vision testing a very specific duty of the public health nurse. Teachers, except in one or two larger cities, had come to look upon children's vision as a health problem for the public health nurse. The solution of this problem resolved itself into a co-operative enterprise by both groups.

In some counties, through the use of the foot-candle meter, superintendents of schools were led to see the value of studying the visual need of children as a part of the learning process. It was pointed out to these administrators that the Snellen visual acuity test, with the accompanying behavior chart, if given by the classroom teacher, would prove to be an excellent means for awakening the teacher to study eye needs of children. A regulation from the superintendent placed this responsibility upon each teacher. The public health nurse became responsible for instructing and supervising the teachers with this testing. Authentic reference materials were supplied by the county health department.

It is not enough for the teacher to know the visual needs of children. In a classroom, the intensity of light is ever changing. Tasks placed upon

children's eyes vary in their demands. The visual mechanism of individuals varies greatly. Each pupil must be guided to understand his own eye needs and limitations. He must know how to use natural and artificial light for best eye efficiency. Throughout the school day, he must have meaningful experiences in the best care and use of his eyes. Thus, the second problem is to help classroom teachers guide children to understand their visual needs and utilize environmental factors for eye efficiency.

Throughout Kentucky, teachers are being urged to guide the children to participate in the study of eye needs as related to working and learning at school. We have many interesting stories of how teachers are approaching this problem with children. For example: Many teachers are using the Classroom Eye Efficiency Seating Chart, recommended by the State Department of Health, as a co-operative group study. Children read the very simple rules of testing vision by the Snellen eye chart. They learn something of the purpose and limitations of the test. They have a part in setting up the chart and getting ready for the testing. A record of the results of the eye test is placed on the seating chart. Children and teachers discuss the list of observable behaviors which may indicate eye difficulties. They decide to observe each other for evidence of these behaviors. Through the use of the foot-candle meter, which they borrow from the office of the county superintendent of schools or from the county health department, light on each child's desk is measured and recorded on the seating chart. On the basis of this chart, seats are rearranged, plans are set up for adjusting shades (or buying new ones if needed), artificial lights may be added or adjusted. As results of such studies, both children and teachers are coming to have a better understanding of visual needs. It has been interesting to note that in many of these schools visual defects have been corrected and glasses are worn more willingly.

Parents, teachers and commmunities need to be aroused to the necessity for eye examinations and correction of defects by trained medical men.

Through means of the recent commercial campaign for "better light—better sight," communities are becoming more conscious of visual needs. School administrators and county health departments are being besieged to purchase all types of eye testing machines and light meters. Many of these devices are of questionable value. Lighting "experts" are going into homes to give advice on home lighting. Following in the footsteps of this better light campaign, we are discovering, in the rural areas, a greater number of traveling "eye specialists." The five and ten cent stores report an increase in sale of eyeglasses. Commercial propaganda moves more rapidly than our slow system of education, but somehow the home and

the school must demand that children's eyes be examined by well trained ophthalmologists. Eyes may be seriously damaged and the pathway blocked to effective learning and good citizenship by wearing glasses which are not suited to the individual's needs.

In some of the larger cities and towns efforts are being made to set up community funds for the purchase of glasses for needy children. Ophthalmologists are making the examinations.

In the discussion of the visual needs of children there are many problems which have not been brought to the foreground, for example: the provision for and use of good natural and artificial light; the avoidance of glare; seats and desks which are conducive to good posture; best materials for instruction; the elimination of fine details from seeing tasks for eyes unable to carry the load; the establishment of sight-saving classes; and the relationship of vision to the child's emotional stability. It is our belief, however, that these problems will be recognized, studied and solved when school administrators and classroom teachers realize:

1. That visual needs of children are intimately interwoven with the learning process—not an isolated health problem.
2. That children must be guided to understand their own visual needs and utilize environmental factors for eye efficiency.
3. That children's eyes must be examined and defects corrected by trained medical service.

CHAIRMAN MCNUTT: Thank you, Miss Harris. I may testify, from the standpoint of a layman, that there is much that is helpful in your comments.

I have insisted that Dr. Phelan join me as co-chairman because she knows the experts present far better than I do, and I am going to ask her, when we come to the general discussion, to assist me when I call for comments. First, she has some of her own on the subject of "What College Students Know about Eye Health Problems of Children (A Report)."*

CHAIRMAN MCNUTT: We have about an hour to devote to the discussion of certain study questions that have been prepared. I believe they have been distributed.

*"What College Students Know about Eye Health Problems of Children (A Report)" by Anette M. Phelan, Ph.D. Published in *The Sight-Saving Review,* Vol. VII, No. 2, June, 1937. Reprints available upon request.

You will find the first questions are:

What school problems in eye health arise from:

1. The conflict between school practices and requirements and the normal growth processes of children?
2. The presence of real visual defects in school children?
3. Environmental conditions under which children work and study in school?

The contributions, of course, will have to be rather brief if we are to cover the four major questions with the subdivisions.

Certain individuals have had experiences which make their testimony rather more important than that of some of the rest of us, and in that connection, on (1) "The conflict between school practices and requirements and the normal growth processes of children," the experience of Mrs. Hathaway of the National Society is particularly pertinent. We shall ask her to open that phase.

Mrs. Winifred Hathaway (National Society for the Prevention of Blindness, New York, N. Y.): Miss Harris has summed up our problem exceedingly well. If I were to put it in other words, I should say that we are still teaching subjects and not children, and until we learn to teach children rather than subjects we shall always have a conflict. She has spoken particularly of the fact that sight is bound up essentially with the educational problem. Most of our teachers are still so lost in reaching the educational and academic goal they forget that the message cannot go through and reach the brain and be properly interpreted unless: first, the sense is able to carry the message; and second, the message has the light to reach its way into the brain.

It seems to me our second point is that teachers do not always realize that these ideas have not only an educational but a social and a psychological effect upon the development of the child. Unless we have the foundational work that will make us understand just what myopia does to a child other than making it impossible for him to see at a distance, or why a child with hyperopia very often has tantrums, or why the child who has cross eyes becomes very shy and introspective, then it is useless for us to try to teach him geography and history.

Our second problem is in connection with our curriculum. We are still including too much eye work despite the fact that we have the possibility of using our ears so much more. Now we have the radio. We have Mr. Damrosch speaking to us through music to the children. We have everything that we may use through the ears that widens and broadens our

program. In this particular, I think the progressive education schools are pointing the way in their activity program. Perhaps the formal schools are following it afar off, but in many cases it is like the prodigal—very far off.

Our third problem is in our environmental conditions. So much has been said about the lighting and various other things in connection with the environment that it is hardly necessary to mention them again.

We have spoken a great deal today about the position of seats, but I don't think we have spoken about the seats themselves. I think that it is necessary to have seats that are comfortable, seats that fit the child, that do not touch those nerves under the knee which simply make him lean forward in order to get into a comfortable position. It is no use to tell children to have good posture and then give them flat desks to work on, where they cannot get a good eye focus. Certainly it is very foolish to tell children, "You must hold your book at the particular distance," and forget that we have individual distances, and we should have desks that work back and forth so the child may have the individual distance.

No amount of training makes up for resourcefulness, and it seems to me I would rather have a teacher who has nothing to work with but resourcefulness than one with all the paraphernalia that could possibly be given, but without the quality of resourcefulness.

So perhaps we could bring out more frequently in our training courses this resourcefulness on the part of the teacher and have her use it, not to do the things herself, but to help the child to develop and to do things for himself, so that he may have not only a sense of achievement but of success.

CHAIRMAN MCNUTT: "The presence of real visual defects in school children?" May we impose upon you for a brief statement, Miss Kerwin?

MISS DORIS KERWIN (Wisconsin Anti-Tuberculosis Association, Milwaukee, Wisconsin): When I first met Dr. Phelan and she learned about the work I was doing, I thought I noticed a particular gleam in her eye. Now I realize that she saw in me a potential guinea pig and promptly began to make plans to inoculate me with the virus of her enthusiasm for a little experiment.

I am a nurse on the staff of the Wisconsin Anti-Tuberculosis Association. I have been giving two-day health education courses in teachers' training schools, in Wisconsin. In this work I do give eye testing demonstrations to the students, with just the idea of finding visual defects, with no idea of preventing them. In our school tuberculosis program, to

be sure, we featured entirely prevention of tuberculosis, but in the eye program prevention had been entirely overlooked.

I started out on several demonstrations with Dr. Phelan to see just how this thing was done. In this demonstration I found myself just as thrilled as the children were. We got their interest by allowing them to participate in the demonstration. I was just as open-mouthed and wide-eyed and found myself stretching my arms out to see if I had a normal vision area. I was as anxious as the children to adjust the shades and move the seats.

Frankly, of course, I was eager to try out this thing myself, and so the result of it was that I have been doing a few demonstrations with the teachers in teachers' training schools, getting them to participate actually, and also getting the children, of course, to do most of the work.

As a result of my investigations, I have found that practically no consideration was given to the left-handed child. For instance, in one school a left-handed child was sitting in the front row, with the light coming from the back of the room and from the left. This child was up in a corner, with only the blackboards to reflect any light. The teachers soon noticed that by moving the child back about three seats he would be next to a door beyond which there was a window with light coming in to give him the very best lighting for a left-handed writer.

In another school, where there were just two movable seats, the teacher put the two left-handed children in these seats, in which they arranged themselves for proper lighting.

I have also noticed that even in schools where they had supposedly correct shades, invariably there was a glare along the side and that the shades were not wide enough and did not seem to fit; and also that the seats were either set in concrete or nailed securely to the floor so that it was impossible to angle them for better lighting.

In all the schools, the teachers, the superintendents, the children, and even the janitors, were thrilled with the light meter measurements and also with the possibilities for having lighter walls that reflected the light.

Here, as elsewhere, of course, a little knowledge is a very dangerous thing, but I do believe that there is a very definite field for teachers and teachers of teachers in the eye conservation program under leadership of scientific authority.

CHAIRMAN MCNUTT: Thank you, Miss Kerwin.

Dr. Francis, do you have a contribution to make to any of these points? Dr. Francis, by the way, is in health education at the University of Wisconsin.

DR. ROBERT FRANCIS (University of Wisconsin, Milwaukee, Wisconsin): I was just thinking, since the discussion has been directed for the most part to this whole child problem, that the whole child perhaps can learn from various types of experiences, perhaps not in this 24 x 32 room you speak of, but from other types of classrooms, in which the child perhaps can gain some type of educational experience. Whether or not there are any relationships between sight conservation and the playground or play areas, I don't know.

I shall cite two or three examples. One is the swimming pool. Often I have seen children, after being exposed to a swimming period, whose eyes were bloodshot perhaps an hour or an hour and a half after that period. I wondered if there was an adjustment there that interferes with the physical development of the child's eyes.

Let me turn you for a moment to the outdoor playground, when the sun's rays are particularly difficult, and you see the child making peculiar adjustments with his eyes, especially in the winter when the snow is on the ground. When we take a child on a hiking trip or interest him in playground games, are those adjustments too much? Are we exposing the child to too much of a strain?

I return you to the gymnasium. Are there windows through which sharp or intense light is coming which splits the vision of the child while he is participating in the program?

To carry it a bit further, I have one more question. Are we giving the type of activities required by the developing eye? In continual intense adjustment, following the ball, for instance, as it goes across the net or as it goes across the wall and back, are the adjustments too much for the developing eye in its physiological processes of evolution? Is there anything by way of adjustment in the concentration of the eye in the child's play program?

CHAIRMAN MCNUTT: Thank you, Dr. Francis. You have turned the tables on us and asked us some questions which seem to be rather difficult to answer.

Dr. Jackson, you have been suggested as a source of information.

DR. EDWARD JACKSON (Emeritus Professor of Ophthalmology, University of Colorado, Denver, Colorado): I shall take the last subject first and state a sort of platform in which I want to discuss these questions. It is my belief that school education should begin about at the age of four, and that the first two years should be given entirely to supervised playground or playroom work, as the weather indicates. There is much

educational value in the games that have been handed down through generations—the games that are adopted by children outside of formal school. Games are essential to the competent use by the child of the cerebral centers in his brain.

One matter has been alluded to several times this afternoon—the cross lighting of rooms. As I stand here, I look directly at the other end of the room, but here is a whole row of windows that are throwing a brighter light on the left side of my retina than is coming onto the macula, the part I want to use. It is true, if I am reading a word or if I am looking at a blackboard, that these cross lights do two things. In the first place, they fall on the part of the retina that is universally recognized by scientific authorities as more sensitive than the macula region that we use in reading.

It is more sensitive to dim light, and you can test that for yourself by going out any clear evening and trying to detect the stars in the sky. You will first detect a star off here in the sky and you will look at it and you can't see it, but if you look a little away from it you will see it again. You can test for yourself that the periphery of the retina is more sensitive than the center of the retina to the field of light, and we expect all our reading and all our exact mechanical trades to be carried on with that kind of setting.

The cross lighting has another effect. All the light that enters the eye from whatever direction—whether it is the light from the book, from a particular word that you are looking at, or all the rest of the field of vision, whether it is 180 or 185 degrees—all influence the size of the pupil. The size of the pupil determines the amount of light that comes directly from the thing you are looking at, and as the pupil contracts with the other light that falls on the eye you get less and less from the thing you are looking at.

That is an exact scientific fact that has been generally known but not brought into the realm of practical application. Our lighting in schoolrooms was very well discussed this morning, and we must take some of those exact scientific facts and apply them in order to bring about improvements that you want.

CHAIRMAN MCNUTT: Thank you, Doctor. Our time is passing rapidly. I suggest that we go on to the next question: "What are the implications in available facts regarding the foregoing problems for elementary school curriculum—materials of instruction, equipment and school programs?"

Dr. Laura Zirbes of Ohio State University seems to be an ideal person to open up that question.

DR. LAURA ZIRBES (College of Education, Ohio State University, Columbus, Ohio): I was saving myself for number four.

CHAIRMAN MCNUTT: If you wish that, Dr. Zirbes, you have our consent.

DR. ZIRBES: I was just thinking, when we were all talking, that a tremendous burden is placed upon educators these days to integrate into their functions all pertinent knowledge and to make intelligent adaptation of it so that children really do benefit.

Not very long ago in Toledo, I heard a great anthropologist, for instance, set up a school program which, according to his idea, was ideal. Well, I should not presume to speak as an anthropologist, but he presumed to talk about education, and he looked at it only from the point of view of anthropology.

It seems to me that what we need is to get specialists of various kinds together to see the total implications of these special fields on the curriculum as a whole. It might well be, for example, that a specialist in vision would correct children's vision so that they would do better the kind of reading that they should not be doing at all. Do you see what I mean? The whole thing is fraught, as Mrs. Hathaway said, with certain broader psychological implications.

Take this whole matter of when to do what in the school. Think, for instance, of language development, to get away from vision for a minute, because we can think too intensively of one thing and not see it as a problem related to other fields. When language is developing and when children's vocabularies are growing rapidly, we put them in school and say, "Keep still unless you are spoken to." We tell them to sit still at the period when they ought to have movement, of all things, in order to get these larger co-ordinations on the basis of which the finer co-ordinations can evolve. We have made all these mistakes, and then we try to tinker with the college students' eyes or to fix something in school lighting and are inclined to say, "Well, you see, schools are as they are, and let's not do anything about that."

Our question here is: Isn't there need for a reviewing of the elementary curriculum? Isn't there a need for reviewing materials of instruction and equipment in school programs so that children can be children, that they can be evolving human beings instead of people who are atrophying in certain aspects in which they are supposed to be growing at a particular time? The child, for instance, who is four or five is beginning to make his social contacts. Now, shall we take that youngster and organize

him in the games that are suitable for eight year olds, or shall we think about all those things that go together to make his education sound? Shall we take this youngster and simply see whether he has vision defects and then push him into reading, or shall we listen to those scientific comments that make us find ways of teaching reading more effectively at seven, and save those first few years for a broader type of experience in which far vision will suffice and which will hence conserve vision and make for richer, fuller backgrounds for reading and the other language arts. Such adjustments are going on. As a member of the board of the Progressive Education Association, I have been traveling around the country during my quarter off duty at the University, and I am not speaking merely about Columbus or Ohio, but what I have been seeing from coast to coast. There is increasing evidence of a critical examination of the curriculum itself. There is still almost too much willingness on the part of the educators to listen to any specialist who comes along at a time when they should be rather listening and holding things in abeyance until they get the basic reconstruction going, and then put those things into the situation together.

The idea of having first-grade children sit in rows in a classroom is obnoxious to any true student of children development.

The idea of trying to give a child a vision test and then doing the thing to him that keeps his eyes from developing properly is obnoxious to any true student of physical development.

The idea of having the youngster go through a school program which makes him do one thing at a time without becoming a sensitive person who sees relationships and uses his eyes to enlarge his life, is also questionable.

We have to reconstruct our educational program. What is the matter with many of our students in training for teaching is that they have learned to see things in books and nowhere else. They can see a child rub his eyes or hold his book much too close, but they go right on and say, "Go on, study now. You won't get through in time if you don't." They don't see what it means in eyestrain. They can see a child twitch and squirm and look one-sided and move his head while he is reading, but it doesn't mean anything to them because they are thinking of teaching reading, because that is the way they were taught.

When I say they need professional experiences in which they become dynamically alert to what things mean to the children before them, then I speak, too, of the development of teachers who are going to object to the kind of three-R curriculum which keeps people's minds out of relation

to their bodies, their senses, their environment, when after all, the environment is the educational medium twenty-four hours a day.

CHAIRMAN MCNUTT: Mrs. Sanguinet.

MRS. CLOTHILDE SANGUINET (Indiana State Tuberculosis Association, Indianapolis, Indiana): I should think the control of glare and the adequacy of light should be a problem that concerns administrators, teachers and children. The administrator should provide the correct facilities and the teacher should know how to use these facilities. Then the teacher should teach the children how to use the facilities correctly and extend that learning into the home. So, I should say, it is a problem for all of our school personnel, with the children as the chief consideration.

CHAIRMAN MCNUTT: The problem of the professional health supervision of the eyes of school children is peculiarly within the province of Dr. Boynton, who was on the program this morning.

DR. RUTH BOYNTON (Director, Students' Health Service and Associate Professor of Preventive Medicine and Public Health, University of Minnesota, Minneapolis, Minn.): I am sorry I am not enough of an expert really to contribute anything as to what should be health supervision of the eyes of school children. I think that is a field in which we need to learn so much more than we yet know.

I am not an ophthalmologist. I am in student health work, and I am interested in vision, but the point of view of the administrator in an institution is responsible for the health of the students.

I have done considerable reading in the last few weeks on this question of vision and eye health, and my feeling after reading what I could find in the literature from the medical point of view is that I do not know just what we should expect of children at different age levels so far as vision is concerned. The opinions in medical literature differ.

We know the young child is probably hyperopic, and that hyperopia is apparently a normal thing. As the child grows older, a certain amount of that hyperopia disappears. That seems to be accepted. On the other hand, there are studies which indicate that this hyperopia does not always disappear, but may be persistent, and a child who is hyperopic at seven years of age may be hyperopic throughout life.

My feeling about this question of professional health supervision of the eyes of school children is that every one of us who has any opportunity, whether in the medical, the school nursing, the educational or the teaching field, should make every effort to contribute some information to this subject.

The discussion this afternoon, with the exception of what I have just said about not knowing enough, makes me think of a story I have been wanting to tell ever since the meeting this morning.

A Tennessee cracker farmer was sitting on his broken-down fence one nice summer morning, and a man came along—a book agent who was selling books on farming. As he came from the distance, he looked over this farmer and looked over his farm and saw that his fences were all down and his house was going to pieces. He thought, "There is a man who needs it," so he went up to this Tennessee farmer and said he had a book on farming he would like to sell him.

The farmer said, "Yeah? I don't need no book. I ain't farmin' half as well as I know how now."

I think that is true of all of us—we aren't doing half as much as we know how.

CHAIRMAN MCNUTT: Thank you, Dr. Boynton, for the contribution and the story. It is well worth while.

On the last point, "Home and School Relationships," we have here this afternoon, Mrs. Ethel Peters Simon. Will you come forward please?

MRS. ETHEL PETERS SIMON (Ohio Congress of Parents and Teachers, Columbus, Ohio): I really feel that there is very little difference between the attitude of the home on the question of eye health than on other questions relative to the education and welfare of children.

In the case of many parents it is ignorance that prevents them from carrying on a program of co-operation, and I believe that this particular question of eye health and the co-operation of the home with the school in setting up a desirable situation in which children should study is caused by lack of information on the part of the parents.

We have one situation in Cleveland which I think illustrates what I have said. The Electrical League of Cleveland over a period of five or six years has been giving instruction to the parents in Cleveland as to proper lighting in the home, proper lighting in which children should study, and many other valuable facts concerning conservation of sight. Of that has come a desire on the part of many parents in Cleveland to have their homes well-lighted and to see that the environment in which the children study is good. In homes where they cannot go into the lighting question extensively, they have provided for the children the proper type of lighting in which they may study.

As far as co-operation between the home and the school is concerned, I think there are many questions involved. The school must realize that

in every community there are interested and indifferent parents, and no amount of co-operation on the part of the interested group can take care of the indifferent group. Teachers need to recognize that there are intelligent parents in the community who will co-operate if they have information and find out what they can do to assist along any line in setting up for their children a better environment in the school or in the home.

CHAIRMAN MCNUTT: You will turn now to the third question:

"What steps have been undertaken to change the professional curriculum in teachers colleges for the purpose of preparing the teacher to meet the eye health problems of children?

1. What gains have been made?
2. What obstacles to be overcome?
3. What sources of help are available?"

There are a number of college men present this afternoon. I think it would be well to hear from some of them.

Dr. Davis, have you any contribution to make on any one of those points?

DR. H. H. DAVIS (Acting Chairman, Department of Education, Ohio State University, Columbus): I think Dr. Zirbes in her discussion this afternoon and probably this morning—I was unfortunate not to be here this morning—has covered the major part of our general attitude toward this question of teacher training; that is, the attitude of having a consideration of eye health as a part of the education problem, but I think I should like to make a few remarks about the administrative angle.

We have a considerable problem not only in teaching teachers but in teaching administrators. Some of you made remarks this afternoon about the problem of getting the administrators to do something else. We do have such courses in administration.

There is one comment I would like to follow a little further, dealing with problems of the school building. It is very evident that we should have a different form of room set-up. We should no longer have seats in rows with the light coming from the left. You mentioned casually that in progressive education the pupils sit around tables where activity work is in progress. That is still worse than when they were sitting in rows. So we have been doing something in the line of setting up model rooms and that sort of thing.

For instance, one of my students last spring in the school building program and problem course attempted to lay out an ideal social science

room for a secondary school. What would it be like? What kind of equipment would be allowed? How would you arrange floor lamps and things of that kind? You clearly want to get away from lights on the ceiling. You want to get away from lights on the side. What do you want? We feel definitely, in dealing with the school administration problems, that to build the building and then to jam the program into it are inexcusable. On the contrary, we should start fundamentally with the teachers and with the specialists in eye health, in this particular instance, and say: "What kind of classroom do you want? What kind of lighting? What do you need in the way of furniture, of equipment?"

And when you get that room, you can go to another subject and another and another. I hesitate to use the word "subject" because we do want to get away from the teachings of subjects and get in the direction of teaching children, and build buildings suitable for teaching children, but since we are organized on a subject basis, let's stick to it just a moment for the purpose of illustration.

If the teachers in the social science area need a particular type of set-up, in the physical education department they need another set-up, and so forth, then the administrator can take these and put them all together and tell the architect to build the wall around them and tell him what kind of windows they want, because that is a part of the whole picture.

I can illustrate that in one way. At one time I helped survey a large school building, a brand new building in a large city. The building had cost over a million dollars. We went into a bookkeeping commission suite of rooms. Along the side a lot of cabinets were built in. We looked at these and didn't know what they were for. We asked what they were. On top of the cabinets books for bookkeeping were piled up. The teacher said, "Those are cabinets in which bookkeeping sets are to be kept."

We said, "That is a fine idea."

She said, "Yes, it would be a fine idea, but none of them is big enough. They are an inch and a half too small to fit the sets."

The administration had failed to consult the teacher to begin with. Somebody had a bright idea. It was all right generally, but nobody followed it up to find out how to make it work; that is, the teacher hadn't been consulted about it until it was all over.

In our dealing with that sort of thing and dealing with the handling of school buildings, we try to impress administrators in the beginning with the educational problems, with the educational program, and with making the administrative facilities appropriate to the functioning of the school.

CHAIRMAN MCNUTT: Thank you, Dr. Davis.

I see, down here in front, Dr. Charles Scott Berry. Dr. Berry, do you have a word to say?

Dr. Charles Scott Berry (Bureau of Special and Adult Education, Ohio State University, Columbus): Years ago I taught a course in school hygiene at the University of Michigan. I went out to take a course in the School Hygiene Association. The morning speaker was a specialist on ventilation. He was reading his report and got about half through when he stopped and said, "I am sorry, ladies and gentlemen, but I can't go any further unless we have a little fresh air in this room." So they stopped and admitted the fresh air.

We have made great progress since then, because we sat up here only a half hour in front before someone kindly adjusted the curtain so we would no longer be blinded by that glare.

I used to be school inspector in Michigan and was very much interested in classroom ventilation, decoration, and lighting. I remember going to one school where the shades were half way down in most of the rooms on the east side of the building. I said to the principal who had taken the course in school hygiene with me two years before, "Why do you have the shades down? Why don't you let them up?"

She said, "The sun was shining in this morning and I haven't got around to letting them up."

She said to me afterwards, "I have worked on this for two years, and I haven't succeeded yet in getting my teachers to put the shades up in the afternoon on the east side of the building that were drawn in the morning to keep some of the sunlight out."

What does that all mean? It means a course of tradition.

Let's turn to the university. Let us suppose we had all the knowledge we wish we had in order to educate these boys and girls properly from the standpoint of vision. Let us suppose we had all that, and that we incorporated it in a course, and that we required this course in all our teacher-training institutions in the country. In view of the attitudes and habits built up in most of these young men and women, how successful do you think we would be under the prevailing methods of instruction to get them to go out and put into practice those principles?

I tried it out for a time in the hygiene course. I found it didn't work at all until I began to consider that course not from the standpoint primarily of how the students were going to use the material out in the schools, but from the standpoint of the growth and development of the students themselves.

For instance, in connection with the subject of nutrition, I asked them

to make a study for one week of their diet and also to make a study of the hours of sleep for one week. How many hours did and could they sleep? I asked them to experiment after the study was made. It had an astonishing effect on some of the students. They discovered a great many things about themselves they never knew before.

Now suppose in considering eye hygiene that we have prospective teachers make a study of the way they use their own eyes.

When I was in college I would sit with a big lamp in front of me and study all evening. One student came along and said, "When you have had as much trouble with your eyes as I have, you won't continue in that position." I kept on for two years longer and then went to see a doctor because I was having trouble with my eyes. I had followed out the procedure I had been accustomed to and had grown up with, and I was not particularly interested when people told me about a better way.

As I see it, we should adopt in our colleges and universities the same procedure Dr. Zirbes was suggesting that we adopt with respect to children, i.e., that we use all the subject matter we teach from the standpoint of growth of the individual we are instructing. If the individual himself learns to put the principles into practice and finds he is greatly benefited, I have no doubt that he will be interested in seeing that the children under his instruction have a large opportunity to benefit from the application of that knowledge.

CHAIRMAN MCNUTT: We should like to ask Dr. Louise Farwell what has been done in her school.

DR. LOUISE FARWELL (National College of Education, Evanston, Ill.): I am dealing with a small number of students. I wish I could deal with a larger number, but I probably should not do as good a job, and maybe if you do a fairly good job with a small number, it pays in the long run.

In answer to what we are doing, for instance, last summer we had an ophthalmologist give us an illustrated lecture on eyes, which was very good. Dr. Buehla Wiseman came out, and so did Dr. Gifford. Then in the class each student had her own eyes photographed with the Ophthalm-O-Graph, and she learned how to diagnose the record. We photographed quite a number of children. I had a small group of students working with me from nine until twelve-thirty, every morning, in the laboratory work. They tested the children's eyes with the Snellen chart and the Telebinocular. The children have watched me work with the rotary prisms in connection with the Metron-O-Scope, which is a machine to control eye movements, and we have had different types of children in the laboratory working so that the teachers could observe my demonstration on that particular

problem. Each child in the building has a book stand available to him. We experimented for two or three years on just the right kind of stand that was practicable in a school room, and we certainly are attempting to have the children read with their books at the proper angle.

As far as seats are concerned, our nurse measures the children and gets the right seat.

I think from the practical school environment we are doing a good job. We are trying to take some of Dr. Phelan's suggestions that she gave when she came to the college.

I wish we could take care of more people in the laboratory work, but as I said in the beginning it is impossible for one person to manage more than eight or ten at a time if one wants to do a good job.

CHAIRMAN MCNUTT: There are a great many people here who have a contribution to make, but time forbids. We have already been in session nearly two hours.

I direct your attention to question number four. I am going to ask Miss Pauline Williamson to comment briefly. Then we shall go to the summary.

MISS PAULINE WILLIAMSON (School Health Bureau of the Metropolitan Life Insurance Company, New York, N. Y.): Encouraging trends in teacher education have already been discussed here this afternoon. One which stands out is the scientific method of attacking our problems. This means that our experiences are constantly changing and that as we evaluate them we need more and more expert guidance.

This afternoon, as we have done with that, we turned to Dr. Jackson, and this morning he told us that he is still learning, so one of our problems is: How are we going to know what Dr. Jackson will learn next year? How are we going to keep up to date? How can Dr. McNutt in his school be sure that those teachers who are being educated are having the benefit of what Dr. Jackson is learning, of what they are doing at Marquette University, and at Chicago?

In these experiences that have been discussed here this afternoon, as Miss Harris talked about her very fine programs, I kept thinking, "How do you know that is based on the very best up-to-date information?" She answered that question as time went on. What is to be the answer for our teacher education schools?

CHAIRMAN MCNUTT: Thank you. Now Dr. Phelan, will you summarize the proceedings of this afternoon for us?

DR. PHELAN: Several people have given us the benefit of their thinking this afternoon. It does appear that there are school problems and eye health problems that arise from the conflict between school practices and the normal processes of the growth of children; school problems and eye health problems that arise from the presence of visual defects in children; problems of personality development; problems of physical growth; problems of adjustment in the school and in the home; and finally very definite problems arising from the environmental conditions under which children work and study. I have run across so many very beautiful illustrations that I should like to share one with you.

In a little Pennsylvania college town we were asked to give an intelligence test to a ninth-grade group of children, 150 children in the room. The only room in the building that would hold those children was an assembly room. The children took the Otis Self-Administering Intelligence Test, which is a paper and pencil test that calls for critical reading and rapid response. As soon as the children finished the test the papers were turned over to the scoring committee, and we took a little meter and tested the light on the desks upon which the children worked. There were two desks in the whole room that had as much as six foot-candles of light. Fifty per cent of the desks had less than two foot-candles of light, and fully 40 per cent of the desks had one or less.

When the report came back from the scoring committee, we found that evidently in that particular high school the ninth-grade group of children were in the moron class so far as the Otis Self-Administering Intelligence Test indicated their intelligence. However, two weeks before, the same children had taken a battery of achievement tests. The achievement tests had been taken in their own rooms, which were smaller and accommodated the group, and were well-lighted rooms, and the curve on achievement was very high. Said the ninth-grade teacher, "See how smart we are! Look what we have done with this group of morons, way down on intelligence and way high on achievement."

What are the implications for the available facts for an elementary school curriculum? It does appear that we need to scrutinize the curriculum, scrutinize the terms of instruction, the equipment, and the school program, not only from the standpoint of eye health of children but also from the standpoint of all-around growth and development of those youngsters.

There are available facts which have very definite implications for the control of glare. In the control of glare, it is best to have windows only on one side of the room. If we are going to keep the window outside of

the child's field of vision, so far as I have been able to work it out in the several hundred classrooms in which we have attempted to adjust children, it is pretty difficult to get the children seated so that no bright window is within the field of view of the child, unless the light comes from one side of the room.

There are available facts which will help us adjust shades and to find the distance from the window at which a desk can safely be placed.

There are implications regarding the health supervision of the eyes of school children. We bring the children into the school. We give them a task to do that calls for close vision. We do have a responsibility for seeing that those children are able, without injury to themselves and without great discomfort, to carry on.

Implications on teacher education have been running through this whole afternoon session.

Mrs. Simon gave us a very good suggestion on the home and school co-operation. Steps have been taken in many schools in the country and certain gains have been made.

There are terrific obstacles to overcome in buildings erected on the Gothic plan, following the medieval custom of having a narrow window to keep the enemy out, in the twentieth century when the purpose of the window is to let light in. We have architectural difficulties. We have conflicts, or a lack of understanding between the interior decorator and the illuminating engineer. We find people eager to go ahead and do things. We find them not ready to go to research or not ready to go to specialists to get the necessary information.

For instance, a few years ago, when I was doing my dissertation, one of the questions related to light from one side—the unilaterally lighted room. One of the big progressive men of the country wrote me a rather critical letter and said, "That is all right in the traditional school but in the progressive school it is not necessary to have unilaterally lighted rooms."

I went to his school to see what happened, and I found little children seated facing bright windows for twenty-minute stretches. I saw children seated without any regard to the direction from which the light came, with bright lights in their field of view.

It does seem to me that the thing that we must do, whether we are progressive or traditional, is to avoid an attempt to get a formalistic pattern in our effort to get an informal relationship. I don't know that there is anything less formalistic about a circle than there is about a square. They are both geometric. We have attempted in the past to assume that the position of a child in the room had a whole lot to do with the socializa-

tion of that room, when the real secret of socialization lies in the relationship between the teacher and the child.

There are very definite trends in education today that need to be kept in mind if we are going to get anywhere in facing and solving this problem on the eye health of school children. Sources of help are available for all of us. I hope you will feel free to call upon the National Society for the Prevention of Blindness for material, for information, for help on questions that involve the use of the eyes.

SECTION V

The Nurses' Approach to Eye Health

Presiding: Mrs. Francia Baird Crocker, Associate for Nursing Activities, National Society for the Prevention of Blindness

The Nurses' Approach to Eye Health (Continued)

Presiding: Ruth Hursh, Special Eye Nurse, Ohio Commission for the Blind

The Nurses' Approach to Eye Health

Presiding: MRS. FRANCIA BAIRD CROCKER, Associate for Nursing Activities, National Society for the Prevention of Blindness, New York, N. Y.

CHAIRMAN CROCKER: In planning the program, the committee had in mind trying to find a common denominator of eye health, something that would be of interest to all nurses. We shall proceed according to the printed program.

Before I call on the first speaker, I want to read a telegram that was received:

> "The National Organization for Public Health Nursing sends greetings to the nurses assembled at your conference and best wishes for a stimulating and helpful meeting."

Personally, it is always a source of encouragement to know that I have the National Organization for Public Health Nursing back of me, and I think it was fine of them to send these greetings at this time.

Because of recent illness, Mrs. Koch who is listed as our first speaker on the program, is unable to come. The notice that she would not be able to attend this meeting reached my desk at the time the program arrived, so I hastily prepared a paper[1] which Mrs. Kuehn, Director of the School of Nursing, Ohio State University, has very kindly consented to read.

CHAIRMAN CROCKER: Our next speaker is Miss S. Gertrude Bush, who is Chief of the Division of Public Health Nursing, State Department of Health, Columbus, Ohio. Miss Bush is going to speak on "What Public Health Nurses Should Know about Hygiene of the Eyes."[2]

CHAIRMAN CROCKER: It is a great temptation at this point to follow through on some of the leads that Miss Bush has given us for further

[1]"Preparing Student Nurses to Assume Responsibility for Eye Health," by Francia Baird Crocker, R.N., Associate for Nursing Activities, National Society for the Prevention of Blindness, New York, N. Y. Published in *The Sight-Saving Review*, Vol. VII, No. 1, March, 1937. Reprints available upon request.

[2]"What Public Health Nurses Should Know About Hygiene of the Eyes," by S. Gertrude Bush, R.N., Chief, Nursing Division, State Department of Health, Columbus, Ohio. Published in *The Sight-Saving Review*, Vol. VII, No. 1, March, 1937. Reprints available upon request.

discussion, but we are going to hurry on to our next paper and then turn the whole discussion over to Miss Howell.

Miss Ailer, Supervisor of Health Education and Visiting Teacher in Galion, Ohio, is going to give us her paper on "Visual Problems in Education."[3]

CHAIRMAN CROCKER: I wonder if all of you were impressed, as I was impressed, while Miss Ailer was reading her paper, with the tremendous amount of knowledge she has of eye health and how she is putting it into practice in her general school program. Here is information that all nurses should have and should be using in their general school health programs.

We expect ophthalmologists to perform miracles in conserving or in saving sight. But now they may be expected even to save lives. The other day when I was reading the magazines that routinely come across my desk, I found a reference to what had been done in the way of devising a camera to note early the explosions in the blood vessels in the eye and to detect them before the pathological changes have advanced so far that the condition is dangerous. The emphasis in this article was that this is a great invention to help in the saving of lives.

Fortunately this morning our speaker is Dr. A. B. Ruedemann, who has had a great deal to do with developing that camera, so he is not only interested in saving sight but in saving lives. I take great pleasure now in introducing Dr. Ruedemann, who will present "Current Trends in Ophthalmology."[4]

Discussion

CHAIRMAN CROCKER: Our discussion leader is Miss Marion Howell, Dean of the School of Nursing and Director of the Course in Public Health Nursing at Western Reserve University.

MISS MARION G. HOWELL (Western Reserve University, Cleveland, Ohio): I am sure that you feel that you have had a very great treat this morning. I should like first of all to express my appreciation to the National Society for the Prevention of Blindness for bringing to Ohio a conference such as this, because we feel it an opportunity to have new stimulus and new knowledge as well as an opportunity for bringing to-

[3]"Visual Problems in Education," by Lucy V. Ailer, R.N., Supervisor of Health Education and Visiting Teacher, Public Schools, Galion, Ohio. Published in *The Sight-Saving Review,* Vol. VII, No. 1, March, 1937. Reprints available upon request.

[4]"Current Trends in Ophthalmology," by A. D. Ruedemann, M. D., Cleveland Clinic Foundation, Cleveland, Ohio. Published in *The Sight-Saving Review,* Vol. VII, No. 1, March 1937. Reprints available upon request.

gether the local forces in our own state, which need to be joined very closely in order to bring about some of the eye recovery which we have had described this morning.

I take it that my function in leading the discussion is more or less to center our attention on the rôle of the nurse in this field and to bring before us some of the problems in the preparation of the nurse. I think Dr. Ruedemann was quite right in speaking with pride of the progress of ophthalmologists, but I am not sure that we nurses can speak with pride of our progress in the education for this work that is available in most of the schools of nursing in this country or in most of the courses for public health nurses of this country.

However, as has been pointed out, there seems to be no general, physical illness that doesn't bear upon the health of our eyes and our eyesight, so that we might draw the conclusion that practically everything that we have in the preparation of nurses is of some value. It has been very interesting to me to watch over a period of some ten or fifteen years in the field of public health nursing the results of the work that we are doing in our public schools. Our students entering the schools of nursing today come to us with much more knowledge of the care of their own eyes than we found in former years, and I think this is largely the result of our work with public schools. It is very gratifying to live long enough to see some of these results.

I think Mrs. Crocker brought out in the first paper the value of the physical examination of the student nurse and of paying some attention to the control of her environment, both for her living and for her study, and I am glad to say that marked progress has been made. Also her knowledge of the eye and the care of eyesight is permeating practically all of her work. It is true that those who wish to specialize in this subject have only a few centers in the United States where they may get this preparation, but at least we have those few centers.

I am also happy to report, as Mrs. Crocker mentioned, that we are having much more of an individual approach to the patient, much more understanding of the relationship of the patient to the family and the family to the community, all of which I believe helps the nurse to have a better approach to eye health.

However, if we are to get any practical value from this discussion of what we ought to do and what we ought to have, it seems to me that the nurses who are present have an obligation to go forth from such discussions as this with a great deal more determined effort to see to it that we have in the field of nursing a more intelligent, a more capable individual,

who brings a great deal more into her professional school and, therefore, gets in her professional preparation a great deal more of value, so that she can intelligently assist the scientists on whom we depend for research and new findings.

Certainly no one of us can sit through a discussion such as we have heard this morning and not realize that anyone who is going to assist an ophthalmologist needs to have quite a bit of scientific preparation, plus all the human qualities that the nurse is expected to have and must have. She has all those very careful details that the physician entrusts to her, and I sometimes wonder how he can ever entrust them to a very young person. I suppose that those of us in charge of young students in the schools of nursing are perhaps more horrified by it than the physician himself.

At any rate, it is always easy to interest the young student nurse in the care of the eyes. I often wish that every student might study embryology. If the nurse knew something of the almost miraculous development of the eye and how it performs its function, she would constantly treat it with awe and greater care and would realize more of the general fundamental principles underlying the care that she assists in giving.

I would plead then that we, as citizens and individuals in our various communities, see to it that we have better schools of nursing which will enable us to do better in preparing nurses, who play a very important rôle, both in the home and in the hospital, as well as in the school and in the clinic, so that they may do their work intelligently. It is a wonderful opportunity for us, as nurses. I remember some very interesting experiences both in school work and in the care of the eye in the home, in which we were following up ophthalmia neonatorum cases. One really walks about all day on a cloud if one realizes that one has instructed a mother so that in the care of one eye the other eye doesn't become infected. Usually the physician on the case depends entirely on the nurse to carry out the technique and to see that it is carried out twenty-four hours a day.

We, as nurses, have a great responsibility, a great opportunity, and I hope all of us, as a professional group, plus all of you who are interested in the profession and rely on the profession twenty-four hours a day and seven days a week, will help us to see to it that we grow more and more in our development as a professional group.

CHAIRMAN CROCKER: Thank you, Miss Howell.

I should like to take this opportunity to call on different people who are out in the field, actually on the firing line in prevention of blindness work, and then we shall have a general discussion. Miss McMillan, field

representative of the Prevention of Blindness Department of the Missouri Commission for the Blind, is here. I know they have been doing a most intensive piece of work during the past 18 months. Several years ago I was connected with the Commission. I know we had only 60 cases on file when I started with the Missouri Commission for the Blind and they now have probably more nearly 6,000 or 7,000 cases in the prevention of blindness file, and I think it would be very interesting if Miss McMillan would tell us what she has been able to do with the large amount of money that their legislature gave them for the past 18 months.

Miss Mildred McMillan (Prevention of Blindness Department, Missouri Commission for the Blind, St. Louis, Mo.): The Department for the Prevention of Blindness in Missouri is a department of the Missouri Commission for the Blind. Funds for the Commission are appropriated each biennium by the state legislature from a fund created by a special three-cent property tax. In order to have money for the prevention department, the amount to be used for this work must be especially stipulated in the general appropriation for the Commission. The Department was established a number of years ago and, as Mrs. Crocker has stated, in 1928 there were only 60 prevention cases in the files.

A year ago the first of last July when the state legislature adjourned, we learned that an appropriation of $50,000 had been made available to the Commission for prevention work. This was a much larger appropriation than the Department had ever had before and there were only 18 months left in which to spend it. At that time the Department staff consisted of two nurses and one secretary, and, since no more money was allotted for payment of salaries, no other persons could be added to the staff. In order to accomplish as much as possible in 18 months, both nurses devoted their entire time to field work, one carrying the responsibility of the rural eye clinics and the clinic follow-up work and the other confining her time as much as possible to the development of sight-saving class work but occasionally assisting with the clinic follow-up.

Mrs. Crocker has asked me to tell you in particular about the clinic work, but before I do this I wish to mention that one new sight-saving class was established in September of this year and it is in a part of the state where it was especially needed. Interest has been aroused in the development of such classes in several other places and it is hoped that additional classes will be established later.

For the rural school children who need sight-saving class help large type books have been made available and are circulated by the Missouri Commission for the Blind. Quite a number of these children are found

through our diagnostic eye clinics. The purpose of the clinic is to find persons with serious eye trouble which, if not found and treated, would lead to blindness or greatly impaired vision. Since most of the ophthalmologists are located in the larger cities, eye care by competent eye physicians is out of the reach of many persons needing it. The clinic offers an opportunity to these people to have an eye examination and to be advised in regard to the eye care that is needed.

The clinics either are held at the request of local people or they are promoted by the Department in sections where the need of eye care is known. In going into the community to arrange for a clinic, the medical doctors and the nurse, if there is one, are the first persons to be contacted. After the proposed clinic has been discussed with these people interested in medical and health work, other key people in the county are contacted. These persons are the county superintendent of schools, the county extension agent, the home demonstration agent, the county welfare worker, the rehabilitation worker, the old age pension investigator and persons connected with such organizations as the Parent-Teachers' Association, the Lions, Kiwanis or Rotary Clubs, and the American Red Cross. Notices of clinics are also sent to the other state agencies, such as the State Crippled Children's Service, the State Trachoma Service, and the Children's Bureau.

One or more local clubs sponsor the clinic and assist in making the local arrangements. The buildings usually used are courthouses, churches, school buildings or lodge rooms. The attendance varies from about 88 to several hundred. Three hundred and seventy-six is about the largest number the doctors have ever been able to examine in one day.

The routine of the clinic is registration, including the taking of the social history; vision tests; and then the eye examination by one of the members of the examining staff of the Commission, who makes the diagnosis and recommendations. After the clinic, the cases are cleared through the County Relief Office, and those not known to the county welfare worker are then cleared through the Rehabilitation Office. For those not known to either of these agencies, information about the financial status of the family is secured from some other responsible person or persons in the community. After this has been done and the cases sorted as to special eye care needed, arrangements for this care are then made for those not able to pay for it.

Since the Commission is allowed to pay for eye care only when the patient is taken care of by one of the staff physicians, it is sometimes necessary for the patient to travel as far as 100 miles to the doctor and

the problem of transportation arises. This is usually secured through private individuals, local clubs or the county court.

In one section of the state there is a National Youth Administration project which includes four counties. Before school began in September there were 95 workers employed on this project. Their special program is to find children with physical defects and to report these children to the proper agencies. Since we held three clinics in this area, we had the assistance of these workers not only in finding the eye cases among children but also for helping with the transportation problem of the clinic.

In the past 17 months the Prevention of Blindness Department has held 30 clinics. One more is to be held this month and this will complete the work of the biennium.

A summary, merely of the number of persons who have been assisted with eye care during this time, is as follows: Operations for 62 children and 330 adults; glasses provided for 2801; refractions arranged for 3257; and examinations for 9300. These 9300 include the persons examined in our own rural diagnostic eye clinics as well as those examined in the doctors' offices and in other clinics. The amount of money spent for hospitalization and glasses up to the present time is $9163.56 for hospital care and $12,431.62 for glasses.

CHAIRMAN CROCKER: I think that really is a splendid report of work that is so profound it impresses me. I am sure that Miss McMillan never even takes Sunday off.

I wonder if Mrs. English is here from the State Council for the Blind, Department of Welfare, Harrisburg, Pennsylvania, and I hope, Miss Hayden, you won't run away before you say a word about what you are doing as Executive Secretary of the Illinois Society for the Prevention of Blindness. Can you tell us what you did about the institute for nurses?

MISS AUDREY M. HAYDEN (Illinois Society for Prevention of Blindness, Chicago, Ill.): For ten years the nurses at the Illinois Society for the Prevention of Blindness have made surveys of the vision of public school children, and we were going so slowly that we finally decided that if we could train 60 public health nurses engaged in school work we would go 60 times as fast. That is a simple problem in arithmetic. So we held an institute this summer limited to registered public health nurses engaged in school work. We didn't sell out on the school work and we didn't sell out on the registered nurses, but we had to sell out in a couple of cases on the public health nurses, because all of the Illinois nurses are not as yet public health nurses although we wish they were.

We limited the course to 60 on advice of the state nursing organization. We had 64 registered from 37 communities in the state, and we certificated 48. We certificated only the nurses who had a perfect attendance record.

We started the course with a general talk on prevention of blindness and specifically on legislation for the prevention of blindness, beginning with the enactment of legislation for sight-saving classes. Then we had five ophthalmologists who gave their time to us to talk on anatomy, physical hygiene, diseases of the eyes that occur in school children, orthoptics, and refraction. We took the girls to two big optical companies in Chicago to see lenses ground and we had a dinner meeting at which the speaker was the President of the Academy of Ophthalmology. We gave one whole day to the actual technique of vision testing and a half day to refraction. Lectures were given on how to conduct school surveys, beginning with the school teachers, school principals, superintendents, and so on, and one lecture presented correction programs, since a survey is not worth much unless it results in securing at least 80 per cent of the corrections. There is just no sense in discovering children with visual defects and not doing anything about them.

Another course was given on how to keep good eye records and how to interpret them. A day was spent at the Illinois Eye Infirmary, observing some surgical procedures as well as methods of handling patients.

When the institute was over, we felt that we had lighted 64 bonfires. I don't know whether we did, but we did light 64 candles.

CHAIRMAN CROCKER: We should be very glad to have further discussion from the floor. The meeting is yours. We should like to continue as long as you wish to.

MISS HOWELL: I should like to ask Dr. Ruedemann whether he is finding a decrease in the number of primary cases of syphilis coming to the clinic this year.

DR. RUEDEMANN: Strange as it may seem the incidence of syphilis is very much lower than you will find in the dispensaries. The incidence runs between five and seven per cent of the total number of patients who come to our organization. With between 70 and 100 new patients a day, 95 per cent have their blood tested. Only five per cent come, perhaps, for the removal of a foreign body from the eye or for some insignificant thing for which we don't feel that we should make blood tests. At your institution and at the City Hospital they run as high as 33 per cent of the new cases, and at the last meeting of the Dermatological Society the

incidence, which had dropped off during the depression, was again rising to a high level.

MISS HOWELL: Dr. Cole, Professor of Dermatology, said the other day that he has quite a time finding enough primary syphilis in his clinic, either at Lakeside or at the City Hospital, to teach the students, and the social hygiene committee of the Cleveland Health Council has made a study of the work in 11 dispensaries in the city this past year and they are finding very few primary cases coming in. Dr. Cole said that last year he had a whole ward of these cases at the City Hospital and today he has four cases. We don't know whether they are decreasing or whether we are really having some encouraging results. He has worked at it for 20 years.

DR. RUEDEMANN: I might say just one more word. I think that the answer to it is that the moral slant has been put so strongly on syphilis that many patients do not report to the dispensaries during good times. If they have any money at all they prefer to report to private physicians. The unfortunate part of it is that the best treatment for syphilis is afforded the patients in these dispensaries. The indigent patient gets the best treatment because he is usually watched over by a professor of dermatology, while if he goes to a private physician, he is likely to go way down in the scale of medical men capable of treating the disease.

CHAIRMAN CROCKER: Are there any questions that you would like to ask any of the speakers?

MRS. VICTORIA SHANNON (Division of Charities, Columbus, Ohio): This is not a question. If there are members in this group who could spare the time they may be interested in seeing the film on syphilis that has been made by the United States Public Health Service. It is being shown at two o'clock this afternoon in the State Office Building, on the first floor. There is a local group that wishes to see it, and the State Health Department is showing it and will be very glad to have anyone else attend.

CHAIRMAN CROCKER: I think many of us might like to take advantage of the opportunity to see that film. Thank you.

If there are no other remarks or questions to ask our speakers, I wish to thank all of our speakers who participated in this program for a most interesting meeting. I feel that it has been very worthwhile.

The Nurses' Approach to Eye Health (Cont'd)

Presiding: RUTH HURSH, Special Eye Nurse,
Ohio Commission for the Blind, Columbus, Ohio.

CHAIRMAN HURSH: I want to take this opportunity to express to the National Society for the Prevention of Blindness, on behalf of the Ohio Commission for the Blind, our overwhelming delight and appreciation at the privilege of having this convention held here in Ohio. We deeply appreciate it, and we are grateful for the privilege of getting together for a "brain feasting" as Sir William Osler once said, for rehabilitation, rejuvenation, reintegration and resuscitation. There is today a moral obligation to think, to plan and to build, and to use both our microscope and our telescope in our efforts to know the truth and see things as they really are.

We have three speakers this afternoon and they cover interesting and worthwhile problems in which we are all deeply concerned. A general discussion will follow in which I hope that many of you will take part.

The first speaker is Dr. Claude S. Perry, Columbus, Ohio. We are very fortunate in having him as our staff ophthalmologist and consulting ophthalmologist for the Ohio Commission for the Blind. Dr. Perry will use the telescope, will look ahead and tell us about preventing occupational eye hazards.[1]

CHAIRMAN HURSH: We shall now need our microscope to analyze blindness and its causes.[2] Miss C. Edith Kerby, Statistician for the National Society for the Prevention of Blindness, will use this microscope. Miss Kerby is an authority on compiling statistics both adequate and complete, and, of course, we all know this is of the utmost importance in supplying the material for social and medical research.

CHAIRMAN HURSH: Having listened to very worth while discussion on the prevention of occupational eye hazards and an analysis of blindness and its causes, may we now know the cost of blindness and what it means

[1]"Preventing Occupational Eye Hazards," by Claude S. Perry, M.D., F.A.C.S., Columbus, Ohio. Published in *The Sight-Saving Review,* Vol. VII, No. 2, June, 1937. Reprints available upon request.

[2]"The Causes of Blindness," by C. Edith Kerby, Statistician, National Society for the Prevention of Blindness, New York, N. Y. Published in *California and Western Medicine,* Vol. 46, No. 1, January, 1937. Reprints available upon request.

to fail to use the microscope and the telescope wherever and whenever possible? Mr. William E. Bartram, Executive Secretary of the Ohio Commission for the Blind, will present this subject.

The Cost of Blindness

WILLIAM E. BARTRAM, Executive Secretary,
Ohio Commission for the Blind, Columbus, Ohio.

There has been much talk from time to time about the cost of blindness, and there have been erroneous interpretations of that cost. Its very implications are of little value to us in dealing with practical minded people who reason from cause to effect in any given situation and in terms of the present only. And, what is more significant, it carries the implication that it is as inevitable as the cost of a funeral for each one of us here present.

So, with your permission, let's introduce a new note. Let's talk about the cost, not of blindness, but of not preventing blindness. A mere play on words, you are likely to say. Well, I wonder. After all, it is only by such psychological legerdemain that we can win our way through the maze of confusing concepts which we so delightfully call "public opinion."

When we talk about the cost of blindness, just exactly what do we mean? For a good many years I have been hearing that blindness is expensive to the citizens of Ohio because they have to maintain an institution for the blind; and yet, what is that institution? It is a school such as the schools that are maintained in every community for the education of the sons and daughters of its citizens. Perhaps the cost of educating these children at the state school is slightly higher per capita over a long period of time than the cost of educating them in public schools. Perhaps we do provide community fund budgets for local society activities—specialized social service; and yet we provide the same thing for other types of underprivileged and less fortunate members of our communities, and we don't shout from the housetops about the great cost.

I have often wondered, frankly, just why we have to inflict upon a comparatively small group of people in this country the onus of being a very expensive group; and I suspect that some of our friends who exercise control over the public purse are beginning to question our sincerity, and see the fallacy of our claim. If we are honest with ourselves, we must admit that unavoidable blindness, after all, is not likely to be quite

so expensive as the figures charged to it would indicate. However, I am not talking about the blindness which we have with us.

Frankly, there is no excuse for having to foot a bill year after year that can be paid promptly and at a very appreciable discount today. Here in Ohio, for instance (if you will permit me to use our own state as an example), in 1931 the taxpayers provided those people who were termed "blind" with $746,885.85, and called that "relief." This is not the time nor the place for me to go into a discussion of how much of that was relief and how much of it was gratuity of a questionable sort, in some instances, and in others pitifully inadequate responses to human needs. In 1932, we spent $789,474.66; in 1933, $832,063.47; and what actually happened was that more people were in need and part of the increased cost of unco-ordinated attempts to meet the situation was being charged to the cost of relieving the blind. So we go astray again when we start to use such figures in determining the true cost of blindness.

We are just beginning to find out something about the total cost of blindness, including that which could have been prevented as well as that which probably could not have been prevented except by going into the field of social hygiene and birth control.

In 1936 the counties were spending at the rate of $653,316.24 a year for cases of recognized blindness. By that I mean those with a Snellen rating of 20/200 or less, or those who have a considerable limitation of peripheral vision—approximately 3600 in number, between 18 and 65 years of age at the present time. There are more than that, of course, in the state. Not all of our blind are dependent upon public aid. In addition, there is a program of indirect assistance to the blind in Ohio as in a great many states. I think some 28 states have developed definite programs. I am not certain as to how far I should go in indicating a program to be termed "blind relief" in some of the other remaining 20 states.

In 1935—and I am obliged to Mr. Irwin of the American Foundation for the Blind for this statement—agencies for the blind spent $1,500,000 for generalized activity service to the group of people defined by Miss Kerby as being in the group recognizable as federal responsibilities. Only a small part of this service was of a medical nature. Not many states, in the final analysis, spent considerable sums of money through governmental agencies for prevention of blindness or restoration of sight. Here in Ohio again, in 1935 it cost $127,540.57 to operate a state school, and the tendency for laymen—for all of us for that matter—is to charge that up to the cost of blindness. If we are honest with ourselves and subtract the actual cost of educating the same group of people in their own communi-

ties, that figure is going to be altered somewhat. But, as I said before, this is the real crux of the situation if we are to draw any conclusions from the figures that we can get from here, there and everywhere: that I may stand here and tell you that Ohio alone is spending $1,790,000 a year because of its blind, but that if you take those figures and analyze them you are going to have to discount them considerably, because not all the people who get help as blind persons are blind, and not all the services which are charged as aid to the blind are aid to the blind. We get no place with such figures. We prove nothing except a general dissatisfaction on the part of the people who would like to see the figures smaller because they represent an alarming expenditure of public funds; and if you talk to many of our sightless people who are, through inadvertant or unfortunate circumstances, forced to rely on public bounty, you will learn that it is much too inadequate in their individual cases. So I come back again to the same thing with which I began.

If we want to talk about something which might have a philosophical connotation, which might be a basis for a future campaign to improve some of the things that we have heard about in the last few days, let's talk about the cost of not preventing blindness and let's forget about the cost of blindness. Inasmuch as we always are in a better position to discuss the things which lie close to us, I am going to fall back on a couple of our own typical counties, one not exactly rural or metropolitan in its make-up, and the other more or less of a rural character.

Please accept my assurance, because after all the identity of these counties must remain anonymous, that they are typical counties. I have not selected any particularly horrible examples. I have tried to take representative counties, with a view toward getting a cross-section, if I can—to steal Miss Kerby's statement—a structural analysis on a comparative basis rather than through statistical research, which latter is in its infancy, I am sorry to say, in Ohio.

We will refer to them as County C and County G. In County C, according to the records at the Ohio Commission for the Blind, there are 148 known blind persons. That, by the way, includes the group having 10/200 vision as well as 20/200. In other words, it is a slightly more liberal interpretation than the recently accepted definition. Of the group, on November first, 65 were being aided as needy blind persons. We have enough information in our files to say, beyond any thought of being disputed, that at least 16 of those 65 could have been saved from blindness by proper and effective preventive measures at some time or other. There are 33 of the group about whom we have no etiological information. So I

can't begin to guess how large a number of those need never have been blind. I should like to be able to say that all 33 could have been saved also, but we will just skip that and return to this number of 16 out of 65.

What is the picture today? We obtained this information at the beginning of this year, with the change-over to a new unified program of relief and medical work. We find that a competent eye specialist now recommends medical care for one and surgical care for two out of those 16. Thirteen are hopeless because somebody slipped, or else there were no facilities five years, ten years, or twenty years ago. (In one or two instances the cases go back about twenty years. The majority of the cases do not go back that far.) What does that indicate as to the cost of not preventing blindness? Please be assured, my friends, that what I am saying to you now is as conservative as any remark I have ever made before a group of people. I am going on record as saying that in that county alone a saving of $175,000 over a period of time could have been effected by a reasonably adequate prevention program earlier in its administrative history; and that figure is based on what we pay out in the course of the normal period of life expectancy of a relief case.

I am not even bothering about the 33 about whom we know nothing and I am not allowing for another five about whom there is some doubt. In other words, there is the cost of the philosophy—$22,500 monthly or $27,000 a year on a comparative basis for the State of Ohio, just because we appear to be willing to let the next generation take care of the fellow whom we might aid by spending some money now.

What is the picture in County G? I was quite interested in some of the statements that Miss Kerby made as to the probable causes of blindness, and by grouping on a percentage basis and by analyzing this other county situation a little differently I could get a recheck, as it were, of the accuracy of my test counties. About 15 to 25 per cent of the total classification falls under the heading of infectious cases, and about 10 per cent are congenital and 10 per cent systemic. Actually, of the 70 cases carried on the register, there were only 56 about which we had sufficient information even to hazard an opinion and I won't vouch for its accuracy. Some of the classification had to be done on the basis of hearsay records. We could classify 27 of them as infectious in origin. We found that we could probably classify 14 as traumatic in origin, 7 as congenital in origin, and 7 as systemic. Of course, I am very shaky about those last two figures. Not only do statisticians, but also some of us who have to rely on what the statisticians furnish, get nervous. At any rate, it was interesting to note that our percentages, if our guesses and our interpretations

were correct, would run about 35, 20, 10 and 10, which isn't very far off from percentages recently quoted and referred to as guesswork for the United States. So I think we have a pretty fair picture here in Ohio.

This county is a very conservative county so far as recognizing the financial needs of its applicants is concerned, and it was spending only $245 a month until this month when it added $15 a month to the total and so is now spending a total of $260 a month. The picture is this: Four of these cases are definitely listed as being born blind. We can't say to you here today that being born blind means born with baby's sore eyes. It shouldn't, of course. That statement would be incorrect. But we have found from some of the statements that have been given to us in the counties that that is what they mean in that part of the state, and I say that there is very little excuse for that condition occurring in any civilized community. I can go on and make the same comments about this group of 56 on relief and the total of 70 known to us in this county, that I made in County C, with the assurance that this picture will not be too inaccurate —that the cost to Ohio at the present time, for lack of adequate prevention measures or resources over the period of the last twenty years, is something around $250,000 or $300,000; and that amount, my friends, could finance a most marvelous prevention program in this state. In fact, it wouldn't require anywhere near that figure to do a really good job of work and to cut down the number of people who are going to be dependent in the future.

As I said in the beginning, it is our responsibility. I am assuming that most of the people present are here because they are interested in knowing what they can do about preventing blindness. Most of you are responsible in some fashion or other for working with the causes of or the results of the things that cause blindness. I have said before, and I shall say again, that each of you can constitute yourself a committee of one to begin with and to build on in your own community, in your own sphere of activity. You can educate your fellow citizens if you will. You can sell them on the idea that there is absolutely no excuse in an enlightened community for allowing these things to continue to happen; that there is no sense whatsoever in running up a tax bill for future generations to pay in order to keep the budget slightly lower today, because, after all, we are not succeeding in that. If we were, there might be some excuse—political expediency if we must resort to such terms—but I don't think there is a man elected to public office who, if he stops to think of the real implications of such an attitude, would willingly subscribe to such a course.

How about it? Maybe in the great group of citizens in the state we

constitute only a small handful here, but each of us—nurses, social workers, and private citizens who are community-minded—can do a lot in our own community toward overcoming the feeling that prevention is something to worry about in the future because the failure of prevention will not be dealt with today. Today is always with us. Please remember that no matter how many figures are given on the increase in relief expenditures or the decrease in relief expenditures, we are not getting at the crux of the problem. The thing we want to know is how much is being spent to prevent this dependency from happening.

When you have made the other people in the community who, with you, make up the body politic, realize that, think about it and examine the records of every legislative committee acting on expenditures in your own local government, or in the state or federal government, as to how much is being spent to correct bad situations (not how much is being spent to take care of them after they have happened), when you have done that, then you have made your contribution and your name should be inscribed on the roll of workers, not for the blind, but for humanity.

CHAIRMAN HURSH: We shall now hear a summary of the afternoon session, to be presented by Mrs. Elizabeth P. August. Mrs. August is General Secretary of the Ohio State Nurses' Association and, while her work has been with state and national organizations, she formerly did eye work and was one of the first eye nurses in the State of Ohio.

MRS. ELIZABETH AUGUST (Ohio State Nurses Association, Columbus, Ohio): I am very glad indeed to have been invited to attend this conference, first because I was one of the pioneer nurses in Ohio, employed a number of years ago in Ohio to establish conservation of vision classes and to visit the various patients coming under the direction of the State Institution for the Blind, and then in the second place, to renew again my interest in this work.

I have jotted down a few outstanding points of Dr. Perry's paper, and then I hope that many of you will want to ask questions. Will you please feel free to do so, and when you rise to your feet, give your name and your home address so that we shall have that information?

One of the first points made in Dr. Perry's very splendid paper was the need for a careful eye examination before the employee is assigned to a job in any industry. I take it that Dr. Perry had in mind that an efficient diagnosis would go a long way in determining the kind of work the employee was best fitted to carry forward in any industry. I believe,

in this connection, our nurses engaged in industrial hygiene work can make a contribution in working with these employees.

It was my privilege at one time to be employed as an industrial nurse with the H. Black Company, in the city of Cleveland, and it was our custom at that time to give every person a thorough physical examination if he desired to have it. In other words, a physical examination was not compulsory. I found, as the industrial nurse in that factory, my greatest problem was to get the employee to realize that this physical examination would benefit him and would not react against him in securing a position in the plant. I presume that same situation exists in many of our industries today. Many of the employees hesitate to have a careful examination, whether it be an eye examination or a general physical examination, because of the fear he or she may have of not being able to be assigned to a certain job in industry. So perhaps the contribution that the nurse can make in industry is to try to explain the reasons for this examination and that it would not react against the employment of any individual.

Another point Dr. Perry brought out was the need for accurate records. I take it he meant the ophthalmologist in making this examination should state definitely, when recording findings of deviation in vision, whether he used the Snellen chart or by what method he arrived at the final conclusion, and that record should help the physician decide. In some of our industries nurses are employed to assist the physician in making these preliminary eye examinations, always, of course, under the direction of a physician. If the nurse makes this preliminary examination she should do it under the direction of the physician, and it should be his name that is filed on this permanent record.

Another point he emphasized was the need for periodical examinations, and while he didn't state specifically how often these examinations should be made, I rather gathered from reading his paper prior to coming here today that he had in mind that as the employee grew older in the service and perhaps reached the forties, he should have this examination more often.

He also emphasized the importance of educational safety programs. We have known of these programs for many years, and in some of our cities like the city of Cleveland and some of our other cities in Ohio—I happen to be more familiar with Cleveland at the present time than I am with some of the other places—we do have very active programs to educate all the citizens in the community. I am wondering, however, whether there is not another place where we should consider a very definite educational program, and I have in mind not only the manufacturing plants, among

the groups of workers there, but our public schools and our civic clubs, parent-teachers' associations and various civic groups in every community. Personally, I do not feel that we have scratched the surface in trying to educate the public to the needs of eye health and conserving vision.

The fifth point that I have to comment on is the importance of trivial accidents. I am going to speak a little more about this particular thing a little later.

The sixth point is proper attention to adequate, proper lighting. That was brought out in a very splendid paper given by Miss Ailer this morning, and while it doesn't apply perhaps as much to industry, because many of our industries have very complete, modern plants, it does apply to many of our schools, especially our rural schools. We have not spent adequate time and have not studied lighting sufficiently to see that it is provided in our schoolrooms and in our industries and certain manufacturing plants.

The seventh point that Dr. Perry stressed was the importance of careful safeguards in our manufacturing plants, and seeing that these safeguards are in proper condition and are intelligently used. When I was at the Fisher Body Company, in the city of Cleveland, at one time there were seven doctors and some 12 or 13 nurses employed there. Men continually came into our dispensary suffering from infections from handling sharp pieces of metal. These infections occurred from the oil into which this metal had been immersed before it was shipped. I have often thought, and I thought of it again when I read Dr. Perry's paper, that if we had known how to take care of one particular factor, many of the men in that plant would not have had 20 or 25 abscesses at one time on their arms and hands. So I think that we should know how to use all of these various safeguards in our manufacturing plants.

The eighth point which I have taken from Dr. Perry's paper stresses the desirability of referring what seems to be a minor injury to the ophthalmologist.

I want to speak again on this fifth point, the importance of trivial accidents. That may mean antitetanus serum. I wonder how much thought many of our industries have given to the importance of employing well-qualified individuals to do this particular type of emergency work. As your chairman said, I am and have been for a number of years the secretary of the Ohio State Nurses' Association. From our records—and we have made a very careful analysis—we have been able to discover only 75 registered nurses employed permanently in our industries throughout the State of Ohio. That means, as you can readily see, that a great deal of this first aid or emergency work—and I could mention a number of our

very large industries—is done by the type of worker referred to in Dr. Perry's paper, by the handyman perhaps in each one of the divisions or perhaps by some department managers.

In a plant not so very far from here during the past two years, 12 men were taken from their regular routine work in the factory and they were given 12 meager lessons in first aid work. These 12 men supplanted 12 registered nurses and were expected to give this very careful first aid to the injured men in the plant and to be able to decide whether or not the injured man should be sent to a physician, or if an eye case, to an ophthalmologist.

I wonder, as does the National Society for the Prevention of Blindness, whether there isn't some work which the Society might be able to do in the way of re-educating the managements of the various industries throughout the United States to the need of employing qualified individuals to be in charge of this first aid work in our industries.

I am wondering, too, if Dr. Perry might not have some suggestion in the way of a program which might be carried forward through a state like Ohio, through our State Industrial Commission and through our various organizations, that would bring this matter to the attention not only of the citizens but of the officials who are directly responsible for this work in the State of Ohio and in the nation as well.

There is one other point that is brought out here, and that is the need for seeking the advice of a competent physician or ophthalmologist. My experience with the work of the Commission for the Blind, dealing with prevention of blindness, goes back to 1914-1917, but I noticed in discussing some of the papers this morning the very same difficulties exist today that existed in 1914.

Many of these cases referred to by your statistician, Miss Kerby, Dr. Perry and Mr. Bartram today, this high cost of preventive eye work, undoubtedly go back to the one point, and that is that the patient, not knowing to whom to go, goes to an unreliable source and is fitted with glasses, when perhaps the real difficulty has been some diseased eye condition such as a beginning glaucoma which first presents itself to the individual as dimness of vision.

I should like to ask Dr. Perry to enter into this discussion at this point.

DR. PERRY: Regarding the company to which you referred as training men in first aid—I cannot see how any individual can be trained in two weeks in what it has taken another individual four years to accomplish. I don't believe there are people who have the ability to absorb knowledge that fast. One of the great difficulties in expanding the Army is to take

untrained men and teach them enough in a three-month period of mobilization to make them acceptable as first aid men. Certainly two weeks is not much time for learning what one should know about the eye. Such a procedure should be questioned.

MRS. AUGUST: The second question is whether you have any suggestion in the way of an educational campaign that might be carried on through the local plants.

DR. PERRY: Yes, a very definite one. I have a suggestion that I am glad to mention. Perhaps you have seen the slides out here in the automatic projection machine. I understand that those slides—and there are many that are very good—are available to you nurses for training purposes and for educational purposes among employees and employers—and they need it too. The facts are so simply and emphatically stated on a number of those slides that the workmen can't miss the points.

MRS. AUGUST: That is all right for the workmen, Dr. Perry, but what have you to say for the general public when you are thinking of conservation of vision and educational programs? Have you any ideas as to how they might be promoted? In other words, you are speaking specifically of the plant—the industry.

DR. PERRY: Yes, that was my paper. I have given quite a bit of thought to this idea of trying to bring such an important subject before the general public and it is extremely difficult. The Parent-Teacher Associations offer a very important link, but after a while they may become suspicious that everything is being dumped into their laps. The entire program must be one of education, there is no doubt about that. Legislation will not do the whole job. It didn't as far as prohibition was concerned. The problem must be one of education and that education must naturally start in our schools. For that reason the teachers and instructors of these students should be properly educated along the lines of the thoughts here this afternoon.

CHAIRMAN HURSH: Are there any questions to be asked?

MRS. SARA DOVER (Special Eye Nurse, Ohio Commission for the Blind): I should like to ask the procedure for removing intraocular foreign bodies.

DR. PERRY: The problem of intraocular bodies is one which most ophthalmologists approach with some temerity. In other words if the foreign body is steel or iron—that is, if it is magnetic—it can be removed relatively

easily. If it happens to be brass or copper, the difficulty of removing it from the vitreous chamber is almost insurmountable. If it happens to be stone or glass, it probably should be left alone, as it may cause very little damage. We meet with that type of accident here in Columbus in the stone quarries.

Of recent years, in fact in the past year, there has been a definite improvement in the technique for the removal of intraocular foreign bodies, namely this: that when a magnetic foreign body is being removed by what is known as a posterior route, in other words, where an opening is made into the eyeball through the sclera or the white of the eye and then the piece of steel or iron is removed through this opening by the magnet, there is always the danger of detachment of the retina following that operation, and since the operation for detachment of the retina, Gonin's operation and others, we have applied that technique for the removal of intraocular foreign bodies. In other words, we cauterize around the wound or the incision that we have made to make sure that the retina and choroid will not become detached at that particular point.

CHAIRMAN HURSH: Are there any further questions? Any questions for Miss Kerby? Do you have some questions, Mrs. August?

MRS. AUGUST: I have just a few comments to make on Miss Kerby's very splendid paper, and one is that it was quite illuminating to me when I went over her paper to get the data relative to the number of states giving a definition of blindness, and I went quite into detail and wrote it out, but she gave it so beautifully that I am not going to go into detail other than to emphasize again the importance of statistics and to urge everyone, especially our nurses, to co-operate to the utmost in keeping accurate records in order to be of more service to the statistician.

There is one other point which I want to make in connection with this paper, and that is the fact that not only is there a discrepancy in the 48 states relative to the definition of blindness, but also as to the uniformity of defining the term blindness in relation to giving compensation; further, nearly all of the states have set up a different amount as to the value of the loss of vision, some states $1800, $2500, $3000, etc.

Now, I shall comment very briefly on what Mr. Bartram had to give us as to the high cost of not preventing blindness. I took down a few of the figures, but I am not going to tire you by quoting them, only to emphasize again that the various amounts given by Mr. Bartram would bring out very decidedly the point that it really costs the taxpayers for not having been interested in preventing blindness. I am wondering in that con-

nection if I cannot reiterate what I already said—this ignorance on the part of people in not knowing where to go to find the expert person to give advice on taking care of eye conditions. I wonder if we couldn't use money spent to correct mistakes to carry forward a really definite campaign of education and prevention.

I was very much interested in what Mr. Guilbert said yesterday here in this room. He is a safety engineer with the Pullman Company and he stood here and said very positively that in the past ten years the Pullman Company had had but one accident which caused total blindness. He said that record was due to the fact that they not only have educational campaigns but they have a requirement that every employee, whether man or woman, must wear goggles. The one accident was caused by the fact that a carpenter, in the performance of one of his duties, pushed his goggles back and a nail broke off and flew into his eye and caused blindness.

I believe from all the speakers I heard yesterday and so far today that much of our prevention of blindness work could be carried on if we had a more positive plan of education.

CHAIRMAN HURSH: Thank you, Mrs. August.

Mr. Bartram, I wonder if you would like to give us a few more statistics as to the cost of blindness.

MR. BARTRAM: Madam Chairman, I won't give you a few more statistics, but since Mrs. August referred to one thing, I might bring out a point that I omitted purposely a little while ago because time was growing short. Perhaps this one point will also interest you. Actually this is the situation on the cost of prevention versus the cost of blindness: In the average case, preventable in nature, an expenditure, according to our records, of about $80 at the proper time means retention of sight or restoration of useful vision. That same case, according to our records and a study in the past ten years of some specimen cases, will cost that same administrative organization over a normal life span a minimum of $12,000 for relief. So, in other words, it all sums up: Which is better—to spend $80 for care this year, or $12,000 in the next two generations for the same case?

CHAIRMAN HURSH: I am sure we all feel that this session has been a very profitable one, and I hope that it will stimulate us to disseminate this knowledge wherever and whenever possible for the prevention of blindness.

SECTION VI

Dinner Meeting

Presiding: A. D. Frost, M.D., Professor of Ophthalmology, Ohio State University, and Vice-President, Ohio Commission for the Blind

Address: "Guarding the Sight of School Children" by Edward Jackson, M.D., Emeritus Professor of Ophthalmology, University of Colorado*

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SECTION VII*

Sight-Saving Classes in the Public Schools

Presiding: H. M. Appleman, Director, Special Classes, Columbus, Ohio, Public Schools

Luncheon Meeting on Sight-Saving Classes

Presiding: Emma Gromme, President, Ohio Association of Supervisors and Teachers of Sight-Saving Classes

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